

In This Issue—*The Service Station Lacks Tone*

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# MOTOR AGE

Vol. XL  
Number 12

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CHICAGO, SEPTEMBER 22, 1921

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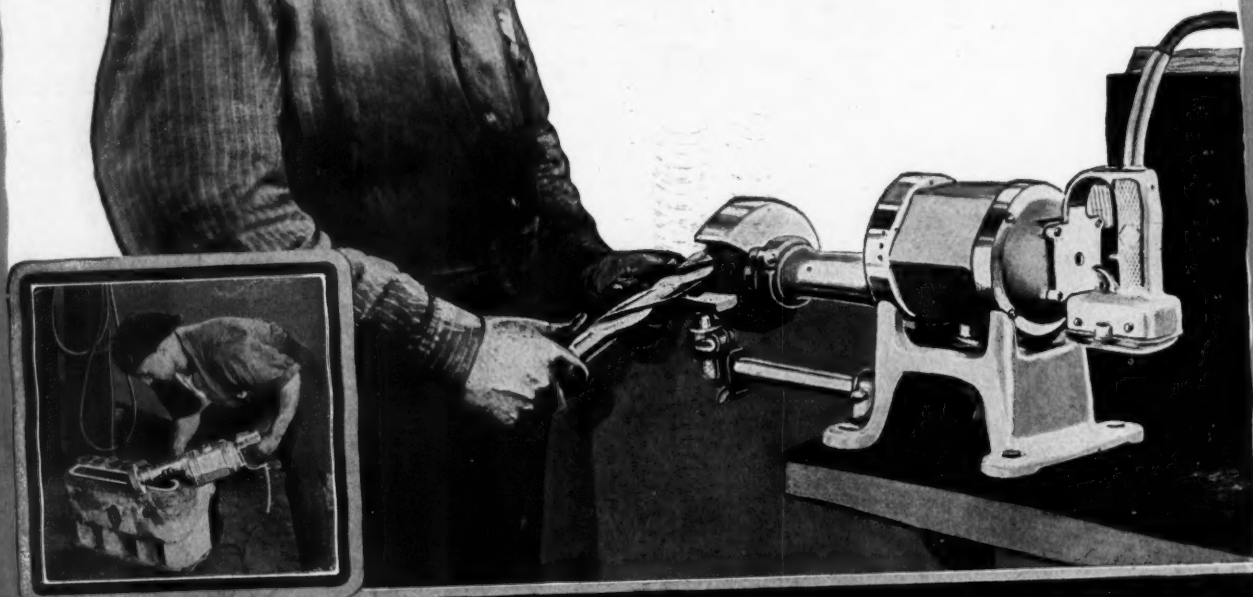
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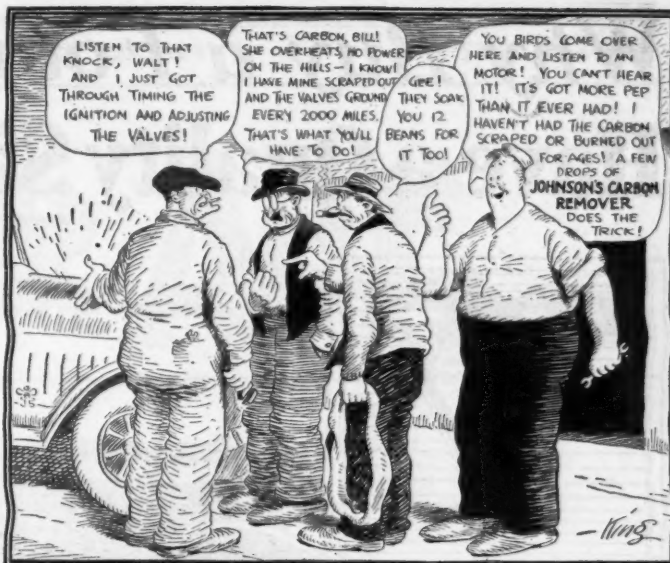
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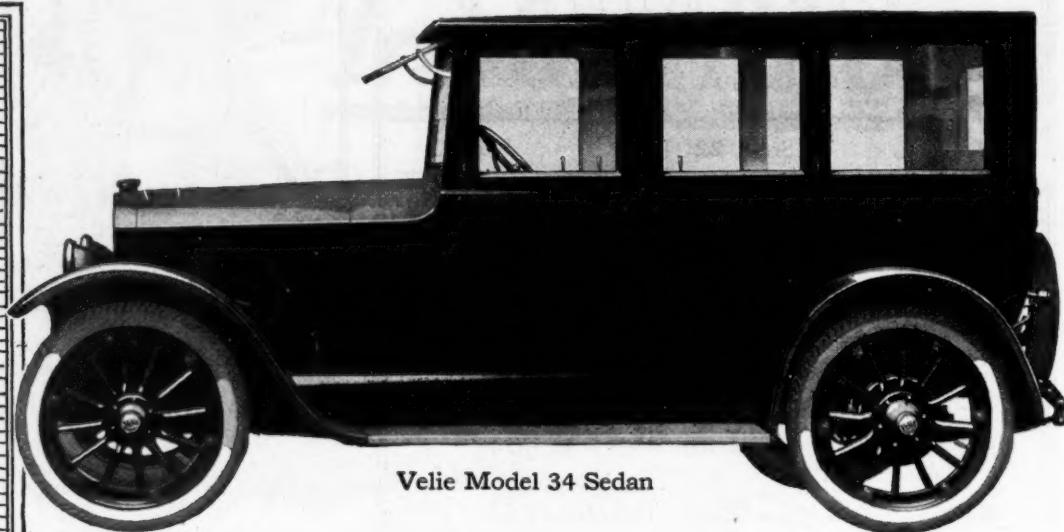
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# MOTOR AGE

## Average Service Station Lacks Tone

*Customers Do Not Feel at Ease as They Do in a Bank or in a Drygoods Store. There Is Too Much Dirt and Disorder in Evidence. Methods Are Lax. A General Housecleaning Is Necessary*

By B. M. Ikert

THE trouble with most of our service stations is they are too dirty.

Those who have been put in charge of them have taken for granted that greasy floors and cob-webbed windows go with the business.

Those very essentials of our living, light and cleanliness, have been totally ignored in the case of the service station, and in their stead we find darkness and filth.

There is too much Circassian walnut in the salesrooms and too little paint or calcimine in the service department.

The large automobile establishment in the large city too often is made up with a gorgeous display and reception room for its prospective purchasers, and yet shunts those same purchasers through a dark alley into some hole in the wall which it labels "Service Department."

And the trouble with the smaller establishment in the smaller town is that the whole thing, sales and service, is a hole in the wall.

The places of business in this industry devoted to the maintenance work on automotive vehicles, as a general thing, have yet to learn many of the fundamentals that underlie the conduct of every-day business—the kind of business we are used to in other lines, the shoe store, dry goods store or the barber shop.

"Well," you say, "this business is different. Automobiles get dirty on the roads and more or less oil and grease collect on them. It's dirty work to repair cars and you cannot help but have the place mussy." And so it goes.

The average service station lacks tone.

And the reason it lacks tone is because those in the business have accepted too many things and have allowed the public to accept them.

We have allowed ourselves to think that just because it happens to be necessary for an automobile to use grease in the transmission and oil in the engine that these commodities have to be in evidence all over the service station.

And, it seems any sort of a fellow can come into the institution and tack signs all over the place, a procedure which does anything but add to the tone of the place.

Go out into any community and step into a half dozen service stations, or salesroom, for that matter, and notice the walls of the place. Ten to one you will find signs and posters calling attention to everything from the Non-fire spark plug to the county fair which was held a year ago.

Then there are the mechanics. We do not mean so much the fellows who stay in the shop all the time, but those who meet the public—those men who nail you when you come into the service station (if you are fortunate enough to get attention) and ask "What's on your mind?" These "contact" men are the ones who either make or break an organization. They have the first word with the customer when he comes in and often the last word when he drives out again.

The "contact" men often can give the place a certain amount of tone by their words and actions, even though the place

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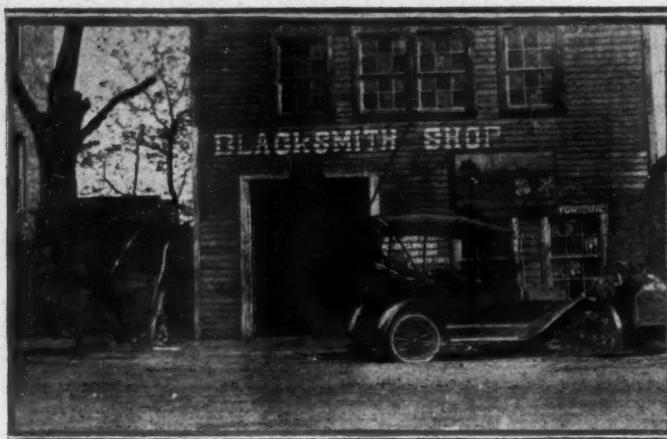
**I**N this article MOTOR AGE attempts to point out to those engaged in the automobile business some of the reasons why car owners look with disdain upon service stations generally. Those who are conducting their business along the accepted lines of any other good business will readily realize that the pointed paragraphs in this article are not directed at them.

---

There are many excellent service institutions in this country. There are men in this business who have the understanding of the fundamentals that govern any legitimate business and who are successful in their undertakings. The trouble is and has been that too many places have been operated under the reverse conditions, and this has brought about the more or less universal condemnation of service stations.

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## Some Views of Service Stations Which Have Given the Industry a Black Eye



This is not the famous Black Hole of Calcutta. The illustrations are those of some automobile establishments photographed by a Motor Age representative. We want to call attention especially to the one in the upper right hand corner. This is the entrance of a service station rendering service on one of the most popular medium-priced cars on the market. We purposely painted out the name of the car. At the right is the "office" of another establishment giving service on a high grade car. But would you feel like trusting your car to a shop, the office of which appeared as this does?



itself might be seething in filth. Suppose the contact man happens, as is often the case in the small establishment, to be a mechanic, whose work necessitates his wearing overalls.

A car owner comes in and wants his car taken out by someone who understands it, to locate some trouble. Now, it makes a great deal of difference to the car owner as to how this contact man goes about this.

Suppose the mechanic has just crawled out from underneath a car and is none too clean. Then, suppose, he says, "Let me take her out" and slips into the driver's seat in the same condition in which he came out from under the car.

Is the car owner going to be sore? He may not say anything at the time, but he will when he gets out of the service station. He may not rave until he gets home and is busy with soapy water and a sponge, cleaning the upholstery and steering wheel rim. But he's going to rave some time.

But now, suppose this same mechanic excuses himself for a moment, goes into the washroom and quietly slips off his coveralls, washes his hands and face and emerges clad in a clean suit of coveralls or a linen duster. Result—customer is pleased at the consideration given himself and his car. Just a case of selling service right—not so much what is done, as the way in which it is done.

### SHYSTER REPAIRMAN KEEPS DIRTY PLACE

In this business it is well to bear in mind that the shyster will always be with us. He has been in other lines ever since business started and he probably will continue for a long time. He has no professional honor. He does business on a side street, has multitudes of signs all over his place and keeps open nights, holidays and all the time. Yet, he does not prosper. His business never grows. He has been on the same street for years and will stay there. He may be a clothing merchant and yet you do not see the clothing merchants who are conducting their businesses along ethical lines worrying about him.

There is the shyster repairman in this business who operates much after the same manner as the clothing shyster. And, the shyster repairman's place looks the part. He keeps

open all hours of the day and night, seldom sweeps the floor, and if he does any bookkeeping it is done on a fairly clean portion of the wall.

A good many men engaged in the servicing of automobiles and operating businesses not altogether satisfactory, have stated at times they realize their organizations are not what they should be, but they are at a loss as to where to begin to remedy matters.

As a suggestion let them just take a look around their establishment. Take a look at the windows. When were they last washed? Certainly there is little excuse these days for dirty windows. There always comes a time between two jobs when men are not busy. In a small establishment the windows could be washed in, perhaps, an hour or two. Washing the windows is a good way to begin, because, having washed them, more light will enter the place and this will show up the inside to better advantage. More light is one of the sadly needed items in most service stations.

### AVERAGE SERVICE STATION CARELESSLY CONDUCTED

We say the average service station lacks tone. Take a look around the floor where the customers bring in their cars. Start with the entrance. Study the pictures on page 8. One picture shows the entrance to a service station and is literally no more than a hole in the wall. Yet this service station is the authorized sales and service station for one of the most popular cars in the country in the medium price class.

How do you suppose a woman driver would feel about driving her car into this sort of an entrance? She may have just come from the bank or from a shopping trip to a drygoods store. She has transacted business in both places and then she comes to the service station to transact more business.

She has just come from the bank and the drygoods store and the proceedings which took place in these institutions are still fresh in her memory. She consciously or unconsciously thinks of the clean floor in the bank, of the neat desks, the courteous treatment. She thinks of the pleasant way in which the floor walker of the drygoods store directed her to the counter carrying the goods she wanted to buy; of the neat



way in which her packages were presented to her and of the general business-like atmosphere of the place.

Then with her mind still fresh with these thoughts she drives into the service station. But maybe she cannot get through the doorway because some mechanic is tearing down a rear axle in the entrance. There is a little more light there and so he has moved the axle from the back of the shop to the front. So, the woman customer stops her car in front of the place.

Unless the extraordinary happens, she will get out of the car and walk up to the entrance to find someone to whom she can tell her troubles. She misses the floorwalker. The man tearing down the axle looks up at her and in reply to her question, "Can I see someone about my starter?" is told to "Go to the office, in front." She goes there, only to find no one there but a girl who is a sort of combination stenographer, bookkeeper, accessory salesman and a few other things. This girl does not know anything about starters and tells the customer, Mr. Blank, who runs the place, is out making a sale.

#### CONTEST BETWEEN METHODS STRIKING

What generally happens then is this: the girl goes out to where the mechanic is tearing down the axle and yells, "Oh, John, can you see what's the matter with this car?" Then John, who has been wrestling around on the floor with differential gears and grease, yells back, "Yeah; just a minute."

All this time the woman customer stands around feeling utterly lost. She misses the tangible evidence of service and consideration—the clerk in the drygoods store who told her but a short time ago to "please be seated for just a minute and I'll be right with you"—the clean floor in the bank! She draws her garments a little closer to her for fear of brushing up against a smeary post. Her white shoes make a wonderful contrast, too, with the slimy floor, black with the accumulations of dirt and oil. She is not at home here.

Then John comes up to her, wiping his hands on some waste or maybe his coveralls. Then follows a series of questions on the part of John, most of which the woman cannot answer. She does not know what's wrong with the starter. She just knows that it will not work all the time. And John is a mechanic. He is not a trouble shooter. He is best off

in the shop. He cannot approach the public properly and is building up more resistance, rather than doing any good by "pinch hitting" for the man who should meet the customers. And so our woman customer finally is told to leave the key to her car and "we'll go after it in the morning."

She walks away and thinks of the proceedings at the bank, at the drygoods store, in contrast to the dismal proceedings at the service station. Her business at the bank may have involved \$25 or \$50; her purchases at the dry goods store may have been a matter of only \$5. In both cases she was well taken care of; yet, in the case of her automobile, representing an investment of, say, \$2,000, she could not get treatment commensurate with such an outlay of money.

#### HOW SERVICE SHOULD BE RENDERED

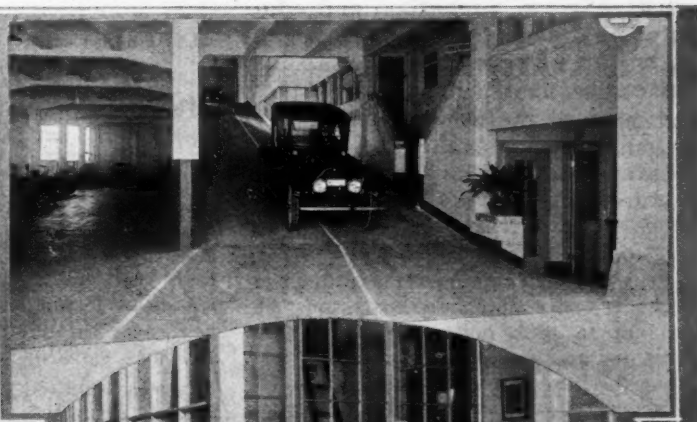
Now, supposing the following had happened: suppose she drove up to the curb of a neat building and entered it. She is in a room with a clean floor, tidy surroundings, and notices a man excuse himself from another customer to come to her and say, "Sit down here, madam, just a moment please and I shall be right with you." She is used to waiting this way in the department store. She has stood in line at the bank, awaiting her turn at the window; at the moving picture show and at other places. She thinks nothing of waiting a few minutes in the service station, providing she has been properly received, and her mind has been put at ease, just as it would be in any well-conducted business.

After the man, whom we might call the service salesman, gets through with the first customer he comes to her and ascertains the nature of her visit. Maybe it is the starter again. Mr. Service Salesman tells her, "our Mr. Jones will take the car to the service department and either fix it, if it is a matter of a few minutes, or inform us as to the disposition to be made of the car."

A mechanic clad in the usual costume may be necessary to disconnect the starting motor, but anyway the woman customer does not see him. Her present surroundings are similar to those of the bank and the dry goods store. She is at home. And when, after a wait of 15 minutes or so, she is told her car is ready and will be out at the curb in a minute, she

(Continued on page 13)

### We Must Have More and More of This Sort of Thing in the Service Business



The building shown immediately above has tone. So has the entrance to the service station shown at the right and also the "office" of still another service station shown in the picture below it. Everyone cannot, of course, have so elaborate a building as the one above, nor such a spacious entrance. But there is nothing very costly about the arrangement of the "office" shown herewith. The customer will appreciate the tone of it, however, because he is not made aware of the presence of grease and dirt and a general disorderly arrangement of things. One has but to look at the illustrations on the opposite page to draw conclusions.



# Service to Consumer Is Keynote of Parts Makers' Convention

*Speakers at Annual Meeting of M. A. M. A. Emphasize Importance of Small Man in the Trade and Are Heartily Applauded. Manufacturers Are Told to Be Helpful, Not Dictatorial*

By James Dalton  
News Editor, Class Journal Co.

ONE fundamental fact stood out like a mile-post in the sessions of the fifth annual credit convention of the Motor and Accessory Manufacturers' Association in Detroit Sept. 15 and 16. It is not new but simply has been forgotten in the orgy of buying and selling which came with the war.

This big, vital, all important fact is that if the automotive industry expects to progress in the future as it has in the past, first consideration must be given to the needs and just demands of the ultimate consumer—the person who buys a motor vehicle.

SERVICE must be the constant aim of everyone within the industry.

All elements within the industry must strive to strengthen and educate the dealer and the service man so he can give better service to his customers. Dealer financing was admitted to be the weakest link in the automotive financial chain, and it was maintained that vehicle manufacturers must evolve some system more helpful than the one now in vogue.

Prices, from raw materials to finished products and maintenance costs, must be brought to rock bottom levels. There must be greater efficiency of labor all along the line. Manufacturing costs must be reduced, every possible economy must be practiced, and inferior workmen must be taken off the payroll that the ultimate consumer may get the most for his money.

One of the most striking statements made at the meeting was this:

"So far as industry is concerned, 1913 was last year."

The man who made it was J. P. Harris, vice president of the Union Trust Co. of Cleveland. He added that the crux of the situation is that we must stop comparing business and profits with 1918 and 1919, which were abnormal years, and go back to a normal period for comparisons.

There was not a note of pessimism in the whole convention. It was agreed that the worst is over, that the tide has turned, and that prosperity is coming back. No one expects a boom and no one wants one. No one has any illusions. As H. H. Rice, president of the Cadillac Motor Car Co. expressed it, "We can confidently expect a very decent business from now on."

Business is better now than it was expected to be a month ago, members of the association admitted, and it has been better for the last three months than it was expected to be. None of the parts and accessory makers have exaggerated expectations for the remainder of this year, but the accumulation of old orders on their books is being gradually whittled down and they are getting some new business. They expect the sale of automobiles to go along for the next three months pretty much as it has for the past four.

## INDUSTRY HAS COME THROUGH WITH COLORS FLYING

The optimism which radiated from the meeting was not based merely on hope. It was founded on fact. Fundamental business conditions are better, not only in the United States but throughout the world. Improvement will be gradual and there will be ups and downs, but there will be no slump. The industry has been through a terrific storm and has come through it sound as a rock, although more or less battered.

It was admitted that the mortality attendant upon the storm, as represented by failures, has been surprisingly small. It is true that the safes of the parts makers are well filled with gold notes and bonds, promissory notes, trade acceptances and all kinds of I. O. U.'s, but the holders of these doubtful securities are not in any sense discouraged.

There was apparent a striking evidence of a desire to cooperate with customers to the fullest extent and not to push them to the wall by filing suits against them so long as there is the slightest chance for the concern which has been the victim of circumstances, to make good. There was a storm of pro-

test against a suggestion that the time for leniency was past and that drastic measures should be applied to force payment by customers who have not reduced their past-due accounts in a year or more.

It was agreed that there are too many companies in the field manufacturing motor vehicles. Many of them were practically insolvent when the war came on, but were saved for the time being by the insatiable demand for their products. Most of these concerns have reverted to their pre-war status and it was admitted many of them could not live on indefinitely.

There was recognition of the fact that drastic measures against some of these companies might save the innocent public from investment in worthless securities put on the market in an attempt to bolster up financial standing. It was recognized equally, however, that the public sometimes resents being protected and the opinion of the majority was that the parts makers should go on "holding the bag" so long as there is any possibility of a company getting on its feet. A going concern, although it may be in a state of innocuous desuetude, is much more valuable than a dead one.

In many respects it was a remarkable convention. It was conceded to be the most successful the association ever held. The attendance reached 250, which officers of the association frankly admitted was many more than they had expected. There had been a feeling that some of the parts makers might feel too poor to make a trip to Detroit, but nearly all of them, big and little, were represented.

There was no disposition to drag into the light the many unhappy experiences of the past year. These men were determined to get down to brass tacks, and they did. They wanted meat to chew on and they got it out of the speeches made to them. They remained out in a stuffy, smoky room until the sessions were over and then they stood around in groups talking it over.

These men had been through a grueling experience in a business way, but out of the welter of their troubles they had glimpsed the big fact that to be successful in the future they must be-



come better merchants and merchandisers. They reached out and grabbed that fact and hung onto it with their teeth. They were determined to get some ideas and to apply them to their own lines.

M. A. Moynihan, secretary and treasurer of the Gemmer Mfg. Co., Detroit, summed up the attitude of the parts makers in his brief address.

"Crops are good, labor is efficient, inventories are down and credit is plentiful," he said. "Let's keep the balance sheet good. Reduce overhead by cutting expenses. Don't use cash capital for expansion. The automotive industry has had few failures in a most trying year. We have marveled at the stamina of some of the weak sisters, but we must expect some further distress among the weaker companies."

"We are in a position to get going. The old order never will return. We are getting greater labor efficiency and we must get greater efficiency from every element of our business. Our units must have good design, economy and sound selling. We must keep down our costs. As makers of component parts we have a big duty to the industry. We must wipe out stock jobbing, contract breaking, under-capitalization and over-borrowing. Business recovery will not be sudden and we have entered an era of keen competition."

"Keen competition" were two words emphasized by almost every speaker. They were agreed that the real merchants are the ones who will succeed in this highly competitive period. This applies not only to the raw material producer, the parts maker and the car manufacturer, but to the man who sells the finished product and the man who services it. They agreed that the man who gives the ultimate consumer the most for his money and who takes the best care of his product after it is sold is the one who will get the most business.

#### SERVICE AND MORE SERVICE EMPHASIZED

In a symposium on "Selling Strategy to Bring the Automotive Industry Back to Normal," service was the big point emphasized. Service and still more service was the central theme of the speakers.

F. S. Armstrong, sales manager of the Vesta Battery Co., Chicago, was one of the most impressive exhorters for service. He began by declaring that times could not be "considered normal when hectic buyers were clamoring to buy ash cans on wheels, backed by Gyp the Blood, for \$1,385 f.o.b. Detroit."

"Automobile manufacturers must realize," he said, "that the buying public is using uncanny discrimination in getting real values. Car selling is not the only strategy. The chief thing to be improved, and the one that will help most of all, is improved service. It must be service that means something, not merely mechanical service, but morality of service. This kind of service will improve business. Many a car owner skins his knuckles tinkering at some job for which he would gladly pay a service man what

it was worth, but not five or ten times what it is worth. The Gyp the Blood must go. I proudly profess a religion of service. He profits most who serves best. The automotive industry must get together to raise the standards of service. We have only one customer and that is the ultimate consumer."

More eloquent than Armstrong's words was his statement that August was the biggest month the Vesta Battery Co. ever had.

#### SELLING THE MOTOR CAR AS TRANSPORTATION

William H. Huff, advertising manager of the Distel Wheel Co., Detroit, declared there should be cooperative advertising by the parts makers through the M. A. M. A. to extend the sale of cars. This was his first point. His second was that men must be taught how to sell. He declared many automobile salesmen were ignorant of the mechanism of their car and of the parts used in it.

"We must teach men how to sell," he said. He told of the countless potential purchasers who never are asked to buy. He added that the M. A. M. A. could well afford to hire a big man to plan selling campaigns.

Another gospel in addition to that of service was preached. It was that of driving home to the intelligence of everyone the essentiality of the motor vehicle as an agent of transportation.

B. F. Rutherford, vice president of the B. F. Goodrich Rubber Co., declared every man in the industry should make this a creed like the Lord's Prayer or the national anthem. He also stressed the fundamental need of service as a sales stimulant. In estimating what was normal Rutherford said a good definition was:

"Normal is 1913 plus the progress made since then."

Resentment of any imputation that the motor car is not an essential ran through the whole thread of the convention. It was emphasized by Harry G. Moock, general manager of the National Automobile Dealers' Assn., in his address on "Business Conditions in the Automotive Industry and the Prospects for the Future," from the standpoint of the dealer. It might be stated parenthetically that Moock made one of the hits of the convention. It was evident the parts makers were eager to hear of the dealers' problems and sympathized with them.

Moock sketched the financial troubles which began for the dealers when the governors of certain Federal Reserve Banks gave out the dictum that motor cars were luxuries and that automobile paper would not be rediscounted. He recounted the fight of the N. A. D. A. to have the stigma removed, but declared that while the battle had been successful so far as official action went, the prejudice still remained in many banks, especially in the rural districts.

"Many dealers are honest, statements to the contrary notwithstanding," said Moock. "The dealer is the buffer be-

tween the manufacturer and the ultimate consumer. I admire him for the way he has met his problems. He has kept the factories running in spite of every obstacle. The dealers who are real merchants are doing business and selling cars."

The average business life of the automobile retailer is three and one-half years. The average of all retailers is seven and one-half years. Something must be done besides making cars and shipping them out with bill of lading attached. The dealer must be shown how to do business. The flux in the industry is a great economic loss. Factory sales managers often do not know what to do. A tremendous educational program is needed to bring automobile merchants up to the grade of other merchants. It has been demonstrated that membership in an association extends a dealer's longevity. The man who has the courage of his conviction that he is selling transportation can dig prospects out of all kinds of odd corners. There is no buyers' strike. Everybody wants cars. It is mostly a question of finance. Everyone who owns an open car wants a closed one. That alone provides endless prospects."

#### REPLACEMENT BUSINESS ALONE WILL KEEP US BUSY

Referring to the subject of legislation and unfair taxes on automobiles, Moock said:

"Just so long as business men continue to elect politicians to office, just that long will we have politics in business."

He said the automotive industry was singled out for attack because it was least organized.

Moock asserted that the used car problem is one for the entire industry to solve, because ninety per cent of the sales involve trade-ins. In many cases the man buying a car is a better business man than the one who sells.

He, too, stressed the importance of service, and he invited the parts makers to cooperate in conducting a course of shop lectures for mechanics.

Another encouraging note was sounded by J. H. Collins, manager of the research department of the Chilton Co., Philadelphia, who estimated that the average life of a motor car is about six years and that there are more than one million five hundred thousand which will have passed their sixth birthday in 1922. He predicted that replacement business alone in the near future would more than take care of the normal production of well organized companies. He added that in the worst year of depression in a decade 500,000 motor vehicles will be added to the number in use. From this he argued that there was business for those who go after it.

That was the underlying thought of all the speakers. They applied it to themselves and to every element of the industry. The man who will succeed in the contest for business is the one who will work hard and intelligently, who will give good value and good service for a fair price.

## Enclosed Car Week Spreading Rapidly, Say Show Managers

*Reports at Annual Meeting of Association Indicate  
Many Special and Helpful Merchandising Efforts Will  
Feature the Winter Season in the Larger Centers*

By Neal G. Adair

*Managing Editor, Motor World, Executive  
Secretary of Show Managers' Association.*

**S**PECIAL promotional activities to stimulate sales of automobiles this fall and winter, including an "Enclosed Car Week" in October or November and special days at the annual shows, were suggested to the trade by the National Association of Automobile Show and Association Managers, which held a two-day session in Chicago last week.

Of the show managers present six announced plans of their local associations to observe Enclosed Car Week. Others reported that a fall show, at a fair or exposition falling on opportune dates, would be their agency of fall promotion. Unofficial reports by members of activities of non-member associations in their territories indicated that there will be many more than six observances of Enclosed Car Week, which the show managers hope may prove its worth this year and become a national movement in 1922.

The special days endorsed for the winter shows were **Appreciation Day and Automotive Equipment Day**. The association recommended that all show organizations recognize these two days and make special plans to promote them.

The cities which will observe Enclosed Car Week, with the dates set, are:

Kansas City .....	Oct. 8-15
Detroit .....	Oct. 8-15
Syracuse .....	Oct. 15-22
Buffalo .....	Oct. 15-18
Rochester .....	Oct. 24-29
Brooklyn .....	Oct. 24-29

E. E. Peake, president of the show managers' organization and secretary of the Kansas City Motor Car Dealers' Association, who went before the big civic organization of Kansas City, told them of the importance of the automotive industry in the life of the community and asked them to show their appreciation by supporting the show. The idea gave the newspapers something new to talk about and the attendance on Thursday evening, Appreciation Day, was not only larger but above the average in character.

Automotive Equipment Day, endorsed

in recognition of the importance of automotive equipment manufacturing and merchandising as a factor in the progress of the industry, is suggested as a day when special attention can be called to the equipment exhibits and when manufacturers, jobbers and dealers can arrange meetings or other means of promoting public interest in and sales of accessories.

The meeting was the early fall convention of the National Association of Automobile Show and Association Managers. The association established a precedent by going outside the industry for its speakers, listening to men from a Chicago bank, from a great Chicago mercantile institution and from the National Association of Real Estate Boards on merchandising and association subjects. These men brought out ideas in merchandising and in cooperative organization work which the show and association managers have taken home for application to the problems of their associations and those of the dealers comprising them.

### NATIONAL ENCLOSED CAR WEEK

With the fall season at hand, the show managers turned their first attention to possibilities of fall sales promotion of passenger cars. E. E. Peake, president of the Association, expressed the sentiment of the convention when he declared the time was ripe for public attention—compelling activities by dealer associations to give the fall passenger car buying season a vigorous start. He declared the Enclosed Car Week was the most practical idea brought forward and urged that all associations holding one, call it National Enclosed Car Week, giving the occasion greater advertising value. He advocated this, regardless of the fact that climatic and other conditions will prevent the simultaneous observance of the week this year. "Give the movement a national name," he said; "try it out this fall and, if results warrant employment of the same or a similar idea next year it may be made national in fact as well as in name, with the whole industry supporting it."

Peake declared that the dealers of Kansas City were going to push right ahead, facing conditions as they are and

making the most of the interest which can be aroused in automobiles with such an observance as the Enclosed Car Week. He said association money as well as individual dealers' funds would be used to promote the week and that there would be a strong campaign of cooperative advertising of the event. Salesrooms will be open evenings, with special decorations, some streets will be roped off, with police permission, to compel traffic to pass through Motor Row and there will be every evening an enclosed car parade, headed by a band. Peake said the week would convince the business community and the general public that the automobile business was far from "dead and buried"—and unquestionably would sell not only enclosed cars, but open cars as well. In the case of dealers with salesrooms on streets other than the main automobile sales thoroughfare Peake said arrangements would be made to accommodate some of their cars in the buildings of fellow association members on the Row.

When Peake sat down five other managers announced plans for Enclosed Car Week in their cities and the rest of the membership, generally approving the idea, said that reports of the discussion would be laid before their associations, with likelihood of favorable action on the idea in several cases.

Members of the Show Managers' Association, all experienced in show and sales promotion work, got back of the Enclosed Car Week idea because of its practical worth in stimulating interest and sales this fall. Stimulation is needed in every city, for its effect on the spirit of automobile sales organizations—on dealers' and salesmen's morale—as well as for the direct effect on sales. **Would an Enclosed Car Week help in your city?**

Most of the managers reported troublesome used car situations prompted by price reductions and by failure of individual dealers to look at their used stocks as merchandise with profit-making possibilities. Several managers reported considerable success in the operation of reporting systems by which dealers, through their associations, keep each other informed about selling prices of various makes and models of used cars. While this has not put a stop to long trading by any means, it has dis-



couraged it by giving dealers accurate information about re-sale values.

The outside speakers were W. Frank McClure, director of promotion of the Fort Dearborn National Bank of Chicago and chairman of the national commission of the Advertising Clubs of the World; G. Raymond Schaeffer, advertising manager of Marshall Field & Co., and Thomas Ingersoll, secretary of the National Association of Real Estate Boards.

McClure, citing the experience of the Fort Dearborn bank, told how institutional advertising will help build a business.

Schaeffer developed even farther the idea of institutional advertising for merchants. Advertising business ideals and policies, he said, will build respect for a company's merchandising authority and aid directly in the sale of its products. He strongly advocated active participation by merchants in the civic affairs of their communities, declaring that public service of this sort is an active builder of public confidence and patronage.

McClure, Schaeffer and Ingersoll reported countrywide improvement in business conditions, as shown by reports to their institutions. Schaeffer said both the wholesale and retail movement of merchandise was improving and Ingersoll said the stagnation in the building industry was slowly being overcome.

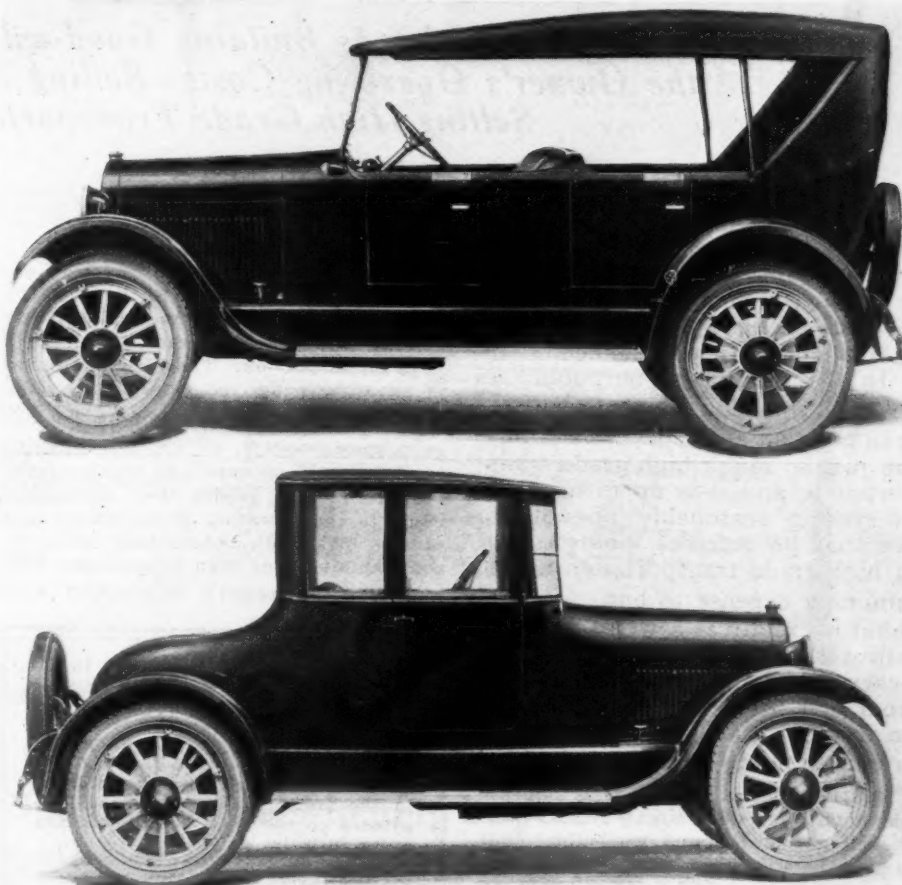
In addition to endorsing the Merchandising Campaign of the Automotive Equipment Association, the show managers elected Ray W. Sherman, director of the campaign, to honorary membership. They presented Sherman, who has resigned since the last meeting as executive secretary of their association, with a traveling bag.

Cities represented at the convention were: Kansas City, E. E. Peake and Bert Coleman; Detroit, H. H. Shuart; Cleveland, Fred H. Caley and Herbert Buckman; Syracuse, Howard H. Smith; Buffalo, C. C. Proctor; Brooklyn, Ralph Ebbert; Newark, Claude E. Holgate; Minneapolis, H. P. Wickham, representing Walter R. Wilmot; Des Moines, Dean Schooler; St. Louis, Robert E. Lee; Little Rock, A. W. Parke; Quincy, Ill., A. L. Stewart.

Guests included Harry G. Moock, general manager of the National Automobile Dealers' Association, and A. C. Faeh and L. E. Skeel of the Cleveland organization.

The annual meeting will be held in Chicago on Wednesday of Chicago show week, 1922, and there will also be a luncheon in New York on Wednesday of New York show week.

## Reo Announces Two New Body Models



These new body models are mounted on the model T chassis of last year which is continued with minor refinements. The model T Series B touring lists at \$1675. On the open car there are two auxiliary seats; the rear seat cushion is a separate assembly and can be removed to allow access to the carrying compartment for the curtains which is large enough to take them without folding. The coupe is designed for professional use and is completely equipped. The price is \$2150.

## Average Service Station Lacks Tone

(Continued from page 9)

thinks pretty well of the place. It is about the same as doing business with the bank or the drygoods store. She feels even much better when she is told that Mr. Jones found the radiator needed water and filled it. She feels the service station is interested in her car. She feels safe in doing business there just as she does with the bank.

Unhesitatingly she pays the charge for the service operation on the starting motor. She is used to paying for service rendered at other places of business, and while the purchase of service on a starting motor is not a tangible thing, like a yard of ribbon or a pound of cheese, the customer to whom it is sold intelligently sees it in much the same light as the service sold by the doctor or lawyer.

Most doctor's or lawyer's offices possess a certain tone that instills confidence in the minds of patients or patrons. A person enters a doctor's office. He is received in a reception room neatly fitted up. A girl is in charge of the room and makes all the necessary arrangements between the doctor and patient. The patient on entering the doctor's private offices and laboratory is impressed by the cleanliness and the equipment—spotless white stands, shining instruments in glass

cases and neatly arranged bottles. The patient is sold on the place immediately. It has tone.

It is possible to take other lines of business and find the same conditions. It is only when we come to our service stations that find the absence of tone. Look again at the picture on page 8, showing the "hole in the wall" and imagine the patient who has just come out of the doctor's office going into this automobile establishment. Is it a wonder a customer looks on with suspicion? Is it a wonder he thinks an institution like this is likely to rob him on a repair charge, when so far as he is able to see there is nothing but dirt and disorder? There is no system. How, then, is he to feel sure the charge for a repair operation will be just?

To be sure, there are automobile establishments operating wonderful service stations. There are dealers who are excellent business men and their places of business show it. They are not all in the larger cities, either. Many are in towns of less than one thousand people. In fact, some of the service stations in the metropolitan cities are the chief offenders when it comes to lax methods. The very bigness of some of these institutions makes it easy to overlook some of the details, those little subtle things that make success.

## Keeping Cars at Top-notch by a Monthly Inspection Plan

*How One Dealer Is Building Good-will by Reducing the Owner's Operating Costs—Selling Motor Cars Is Selling High Grade Transportation*

**T**HE first step in rendering proper service to car owners is to gain a clear conception of what that term implies. It is impossible to carry out a policy until that policy is clearly defined.

In the first place, our policy in this organization is that, when a man buys an automobile, he is buying just so much high-grade transportation, and it is up to us to do everything reasonably possible to see that he receives that quantity of high-grade transportation at the minimum expense to him. We feel about it exactly as a well-conducted railroad feels when they sell him a ticket. They agree to haul that man from and to the points designated on the ticket, and excuses, evasions or compromises do not count.

We have tried in every way to impress this upon our entire organization, sales as well as service, and we believe that all now have a clear conception of our policy in this regard. This being so clearly understood, every other service step under it becomes a detail, just as the details of railroading naturally grow from the type of service which it is the aim of the transportation company to give.

### MONTHLY INSPECTION SYSTEM

Of the three words "giving good service," it is our belief, backed up by our experience here, that the word "good" is the most important. In other words, no owner minds paying a reasonable bill if the work is well done, but he will object,—and object legitimately,—if the work is not properly done, even though he has not been charged for it. So correct mechanical work is another fundamental of our service policy.

Service starts with the order, and the first step is to see that the customer understands our policy in this regard clearly, finally and with no chance for misunderstanding or misconception. To accomplish this, we give the customer, when he signs his order, a letter clearly setting forth our guarantee. When he has read this, there can remain no doubt in his mind as to what we mean by "Service."

On the theory that great oaks from little acorns grow; that all major repairs and troubles have their origin in

By COL. E. S. GORRELL  
Manager of the Al. G. Faulkner Co., Inc.,  
Marmon distributor for California

minor things, we aim to have every Marmon in the San Francisco territory coming into our shop once every thirty days for inspection. There are a number of advantages derived from this system.

In the first place, by looking the car over once a month, we are able to catch small maladjustments and similar troubles frequently before they have even come to the attention of the owner and almost invariably before they have become annoying, or even pronounced. This increases the owner's satisfaction with

his car which is a distant factor in building up good-will.

In the second place, any work that might be required as a result of these inspections is generally apt to be low in cost and the payment of a number of small bills contracted in this way is far less objectionable than the payment of one large bill, as in the case where the repair work is left to accumulate for a general overhauling, even though the owner may spend no more money on a general overhauling than he would spend periodically through our monthly inspection system. He feels it less and is more contented with his car.

A third advantage is that we keep in more intimate contact with our owners. They feel that we are taking greater interest in the welfare of Marmon cars and frequently, out of a sense of gratitude for this service, give us the names of new prospects and help us to close prospects on whom we are working.

As to the details of how this system is worked out: two weeks after a man takes delivery of a new car he receives a letter telling him of the service. The letter states that there is no charge for these inspections and that no work will be done except on his order.

Two weeks later, or a month after the car has been purchased,—a return postcard is sent the owner, making an appointment for him to bring his car in for inspection. The return card is provided so that the owner can either accept the appointment made, or change it if the original appointment is inconvenient.

Each month thereafter a similar postcard is sent to the owner, so that he is notified at least once every month that his car is due for inspection. A simple follow-up card is used to time the subsequent postcards. The time when the owner brings his car in for inspection in response to the appointment card is also noted. Room is provided for notations such, for instance, as the fact that an owner is out of town for several months, during which time no cards should be sent him.

These follow-up cards are filed alphabetically, so that it is very easy to look up the record of any owner. The little figures at the top are the days of the month and a metal signal tab is used to indicate the day of the following month when a card should be sent out. Very little work is entailed in

### Al. G. Faulkner Company, Inc.

Distributor  
California, Nevada, Hawaiian Islands  
Post at Hyde St. Figueroa at 17th St.  
San Francisco Los Angeles

**T**HIS Company's interpretation of the standard Factory Guarantee printed on the back of the attached order form is:

That for 90 days after the delivery of the new or renewed Marmon automobile covered in the attached order, the following work will be done free of all charge:

Cleaning spark plugs.  
Adjusting valve tappets.  
Adjusting wheel bearings.  
Adjusting shock absorbers.  
Tightening nuts, bolts and spring clips.

Taking out squeaks and rattles that do not belong in a car.

Oiling and greasing. (Labor to be free; owner to be charged for any oil or grease that may be used.)

Draining crankcase and refilling with fresh oil. (Labor to be free; owner to be charged for any oil or grease that may be used.)

Replacing any new parts that may be defective, free of charge.

Insert:—

This is the broadest guarantee of which we know and you understand that it is the only one any salesman or other representative or officer of this Company is empowered to make. If this is not your understanding of our guarantee please advise us at once.

Very truly yours,

AL. G. FAULKNER CO., INC.  
To make this guarantee effective, it is mandatory that the oil be changed after the first 500 miles and every 750 miles thereafter.

A letter to the owner like the above leaves no doubt in his mind as to what the guarantee means. This will head off any misunderstanding later



AL. G. FAULKNER COMPANY INC.  
 THE TRIUMPH CO.  
 CALIFORNIA, NEVADA, HAWAIIAN ISLANDS  
 POST AT HYDE STREET  
 SAN FRANCISCO  
 MARMON  
 REGISTERED AT SEVENTEENTH ST.  
 LOS ANGELES  
 SAN FRANCISCO

August  
 1921

Mr. John Jones,  
 3232 Lake Street,  
 San Francisco, California.

Dear Mr. Jones:

You will shortly receive from us a notice of an appointment to bring or send your car to our service station for its first regular monthly inspection. There is, of course, no charge for this inspection.

Minor adjustments or other work which comes under our guarantee are also free, and no charge work of any nature will be done except on your order.

It is obvious that these periodic, expert inspections are the most effective way to maintain your car in perfect condition, and we therefore urge you to take full advantage of this service.

When you bring your car in, I trust you will give me the pleasure of meeting you personally.

Sincerely yours,

*H. L. Madison*  
 Service Manager.

H. L. Madison  
 2

AL. G. FAULKNER COMPANY INC.  
 THE TRIUMPH CO.  
 CALIFORNIA, NEVADA, HAWAIIAN ISLANDS  
 POST AT HYDE STREET  
 SAN FRANCISCO  
 MARMON  
 REGISTERED AT SEVENTEENTH ST.  
 LOS ANGELES  
 SAN FRANCISCO

August Twenty-Seventh,  
 Nineteen-Twenty-One.

Mr. John Jones,  
 3232 Lake Street,  
 San Francisco, California.

Dear Mr. Jones,

On the first of September, we will inaugurate a system of monthly inspections of Marmon cars which, it is confidently predicted, will be of the greatest benefit and service to our patrons.

Once every month, you will be notified by mail of an appointment to bring or send your car to our service station for inspection. This inspection will be made as quickly as is consistent with thoroughness, and you will be furnished with a report on the condition of your car.

There will be no charge for this service. Minor adjustments will be made free and no charge work of any nature will be done on your car except as ordered by you.

It is obvious that these periodic, expert inspections will not only materially increase the satisfaction your car is giving you but will undoubtedly effect gratifying economies in its operation and upkeep. For instance, it frequently happens that some slight maladjustment caught in this way saves a major repair operation later.

It is exactly the same principle on which you have your teeth inspected at regular intervals. All motor ills are small in the beginning and only become serious through neglect.

You will shortly receive your first inspection appointment notice. Kindly return the post card, to be mailed you later on, and arrange to have your car in our service station at the specified time so the inspection may be made with the least possible delay.

Very truly yours,

*H. L. Madison*  
 Service Manager.

GLM:l.

## Making the Owner Receptive to the Monthly Inspection Plan

These letters were carefully worded and typed to be sent out to owners of Marmon cars, appraising them of the monthly inspection service. They are really sales letters selling the owner on the benefits he will enjoy if he will cooperate with the service station in having his car inspected periodically. The letters have much to do with the success of the plan

keeping this card record up to date and in sending out postal cards.

In addition to these monthly notices for inspection, we employ a man, whom we term a "service salesman." This man has a list of all Marmon owners in our retail territory, and spends his time calling on them in rotation.

He determines at first hand how their cars are running and tries to learn what we can do to increase the owner's satisfaction with his car. Cases where owners are disgruntled and are not coming in in response to our postcards, or where they feel they have some legitimate grievance, and will have "nothing more to do with us" are dug out and corrective treatment applied by this man.

Incidentally the service salesman digs out many new prospects whose names are given him by satisfied owners, so the expense of employing him is well repaid.

### CAREFUL INSPECTION

This whole system would fall down and entirely fail of its effect, if the inspection were not thorough enough to disclose the true condition of the car. This applies with equal force to any

job that comes in our service station, whether for monthly inspection or not.

### INCORRECT DIAGNOSIS

It happens all too frequently that an owner will bring his car in and give orders to have certain work done. He does this because he feels that this work will take care of certain troubles which he may have observed in operating the car. In too many cases the owner, not being a trained mechanic, does not diagnose the trouble correctly, and although the work he orders is correctly done it does not cure the trouble and when he takes his car out and finds the trouble uncured, he is likely to say that the work was not properly done and object to paying the bill.

For that reason, we make it a rule not to do repair work other than minor adjustments on any car until we have completely inspected the car and come to a definite conclusion as to what is causing the trouble. Right here is where the most careful inspection pays.

To insure this, we use an inspection form on which it is possible to enter the inspection of every major part of

the car. It is not the intention that the inspection be carried in such detail in each case, but the inspector is provided with a logical system of inspection, and a place on which to note everything he may discover. Of course, in the case of an estimate on a complete overhauling job the entire card is filled out.

### OWNER SIGNS ORDER

When the inspection form has been filled out, it is submitted to the owner and he is then given the opportunity of ordering such work as he may wish to have done, based on the findings of the inspection. The order for this work is written out on Repair Shop Order Form and signed by the owner. In most cases the flat rate system is followed, so that the owner knows in advance what the ordered work is going to cost him.

After the work has been completed, the Repair Order form, which follows the job through the shop, is turned over to a tester, who again tests the car to see that the work has been properly done. In other words, no stone is left unturned to see, first, that the work being done is of the right nature to cure

the trouble and, secondly, that the work itself is properly done.

Another source of difficulty with owners is a misunderstanding of where the money they spend on their cars goes. It is not unusual to hear an owner say, "I have spent too much on my car. It has cost me \$700 in the past year to keep it going." It frequently happens in a case like this that, if an accurate analysis of these expenditures could be made, it would be found that, of the \$700, possibly \$300 has been spent for oil, gasoline, washing, etc.; \$250 or more for tires and other accessories and supplies, while something less than \$150 has actually been spent in keeping the car up. When confronted with an analysis of this nature many owners change their tune and ill-will is turned into good-will.

#### PERMANENT RECORD OF COSTS

To check this up, we use a permanent cost record. This is in the form of an envelope. All invoices go over the service manager's desk. As he approves them, he takes off one copy and the amount of each invoice is entered in the proper column on the cost record form and the invoice placed within the envelope. These envelopes are filed alphabetically by owners' names, and it is, therefore, a very simple matter to look up, at any time, the record of any man's car, and find out just what it has been costing him during the period covered.

This system is also a very good way to check up the efficiency of the shop because, any time that the cost of operation on a given car is running unusually high, it is easy to investigate the work done and see whether the fault is with the driver, the car or the shop.

Courtesy in all our dealings with customers is, of course, a foregone conclusion. This does not mean a spineless, weak-kneed acquiescence in every kick. One must stand up for his product in the face of any objection, but one can do so with courtesy and respect. This is absolutely insisted upon from every member of our organization from the writer down, and has been an investment that is constantly paying good dividends.

As a little example of how this is applied to the service end of the business, whenever a car leaves our shop, we send out a card asking the car owner to let us know if the work was not done to his complete satisfaction. There are too many of these to warrant a typewritten letter in each case, while an obviously processed letter is insincere, so we use a rather formal and attractive card, personalized for the owner by having his name written in exactly as in the case of a formal invitation, a guest card to a club, etc.

#### RESULTS

The results of these plans and systems in our service department are so many and so far-reaching as to be difficult of concise statement. Briefly, it can be said that the greatest advantage

#### REGULAR INSPECTION CATCHES THE TROUBLES WHILE THEY ARE SMALL

Cards like these make it possible for the service station to arrange definite dates for the monthly inspection and enable it to regulate the work to keep the men busy all the time

Date \_\_\_\_\_ 192

Your car No. \_\_\_\_\_ will be due for its monthly inspection on \_\_\_\_\_ 192. Please bring or send it to our service station at Post and Hyde Streets before noon on that day.

There is no charge for this inspection or for minor adjustments.

You will be advised of the nature and cost of any charge work necessary and such work will only be done on your order.

Please fill in the attached card notifying us that your car will come in at the time specified or in case this appointment is inconvenient please state when it will be here

AL. G. FAULKNER COMPANY Inc.  
Service Manager

---

AL. G. FAULKNER COMPANY Inc.

Gentlemen,

I will have my car in your service station for monthly inspection on \_\_\_\_\_ 192 at \_\_\_\_\_ M

Signed \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

is the accumulation of good-will on the part of car owners, with its consequent effect on sales.

It is our belief that this sort of work, which costs real money to do properly, is the best form of advertising any car can have, and so we regard a large share of our investment in it in the light of advertising.

A secondary result is the development of a large enough volume of legitimate pay service to afford the maintenance of a large, adequately equipped service station, which will pay a reasonable return on the investment and cost of operation.

That this may be done, and at the same time lessen the cost to Marmon

owners of using Marmon cars; to increase their satisfaction in their cars through better, more continuous and more consistent service, is the real accomplishment of a system of this kind.

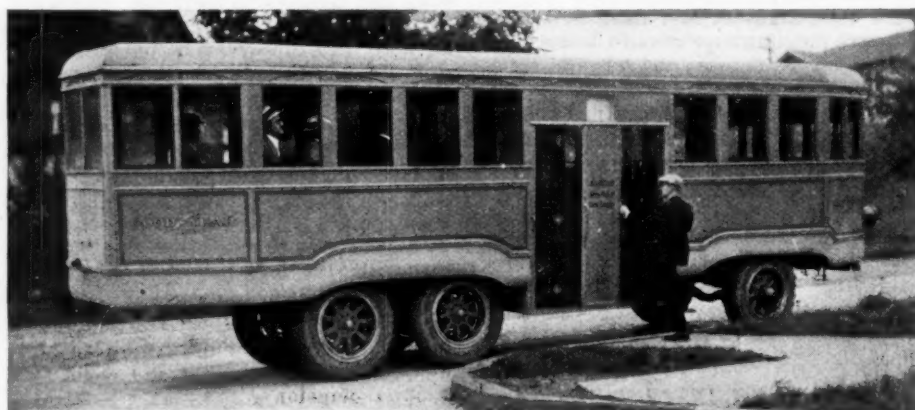
#### STANDARD LOWERS PRICES

Detroit, Sept. 16—Price reductions averaging 15 per cent on its entire line were made by the Standard Motor Truck Co. today.

The new Standard prices are:

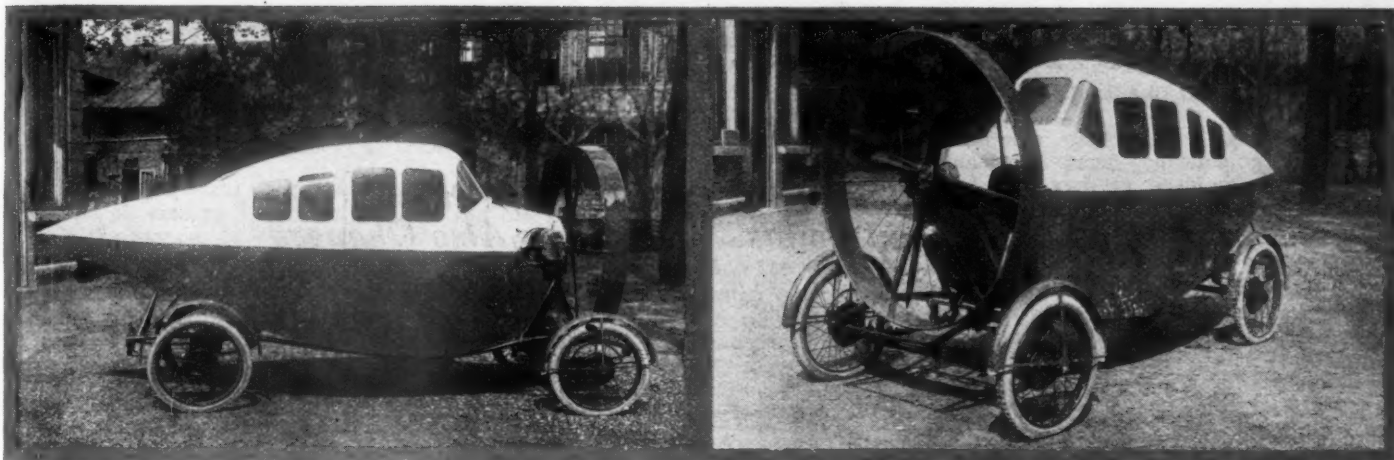
	New	Old
Model 1-K 1-1½ ton.....	\$1800	\$1950
Model 76 2½-3 ton.....	2000	3100
Model 66 3½-4 ton.....	2800	4000
Model 5-K 5-7 ton.....	4400	5250

#### Railway Capacity on Pneumatic Tires



Automobile buses with high carrying capacity and ease of riding have been difficult to design. Above is shown how the Goodyear Tire & Rubber Co. planned one, for the use of its employees in sections not served by the railways. This bus uses six large pneumatic tires and has an overall length of 31 ft. and a width of 7½ ft. It will accommodate 50 to 60 passengers





The construction of the new French cars driven by an aerial propeller is very light. The model shown above weighs 520 lbs. and will attain a speed of 50 m.p.h. on the level in still air

## Air Propelled Cars Being Developed by French

*Need for Fuel Economy One of the Factors Behind Attempts of European Manufacturers to Produce Lighter Motor Vehicles*

**A**TTEMPTS are being made by the French automobile industry to solve the problem of economical locomotion by the use of cars driven by an aerial propeller.

There is nothing in the French laws against the use of a vehicle of this kind on the streets or highways, although the government technical department, which has to pass on the safety of all new types of cars put into service, has the right to impose whatever restrictions it considers necessary.

These engineers have put their stamp of approval on aerial propellers for road work, providing the diameter of the screw does not exceed the track of the car, this latter being limited to 56 in., and providing that there is a circular guard around the propeller and a wire gauze netting in front of it. In some cases it is insisted that brakes be fitted to all four wheels, but in every case there must be two independent sets of brakes.

The machine produced by La Traction Aerienne, which is one of those in regular production in France, has a closed, carefully stream-lined body with two

seats in tandem, a twin-cylinder air-cooled engine in front, with the four-blade propeller mounted directly on its shaft. Steering is by the front wheels; the total weight is 520 lbs. in full running order, speed on the level, in still air, is 50 m.p.m., and gas consumption is given as 60 miles to the gallon.

Construction is light and at the same time simple, the chassis being made up of steel tubes, with tubular axles attached to the main frame members by semi-elliptic springs. A triangular frame in front carries the horizontally opposed twin-cylinder engine, the dimensions of which are  $3\frac{1}{2}$  by 47/10 in. bore and stroke.

The engine has a detachable L-head, hollow crankshaft, forced feed lubrication, light rods and aluminum pistons. To save weight, the tubes constituting the frame are made use of as exhaust pipes. The carburetor is on the outside, and the magneto inside the body, driven off the end of the crankshaft.

All the driving is done on the throttle and with the brakes, there being no clutch nor transmission gears. The tread is 55 in. in front, reduced to 39 in. at

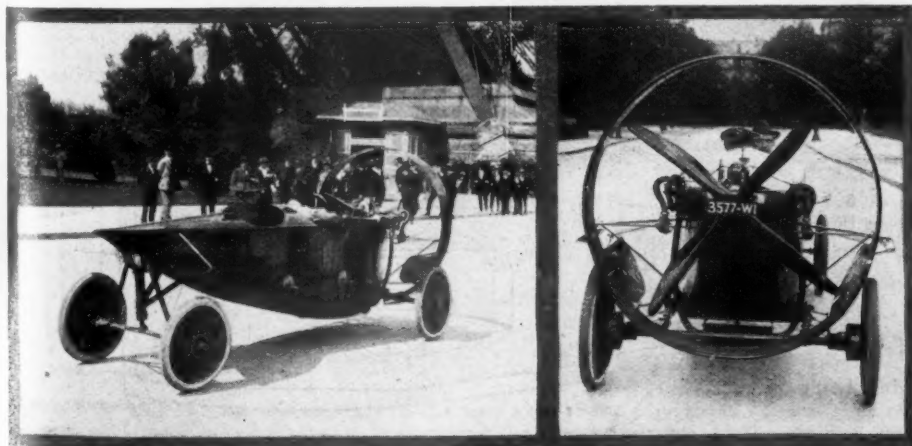
the rear, motorcycle tires of 26 by  $2\frac{1}{2}$  in. being fitted. The diameter of the four-blade screw is 51 in., and the pitch, usually employed, 27 to 30 in. The wheel base is 86 in. and over-all length 153 in.

The body lines have been carefully studied to get the best streamlining effect, and it is for this reason that a closed type has been preferred to an open body. Aviation practice has been employed in the construction of the body, which is built of three-ply wood.

Another make is the Leyat, which is a tandem two-seater with an open body. This machine is more on the lines of an airplane fuselage, for it has no separate frame. The front axle is fixed and attached to the body by means of cantilever springs, with radius rods to prevent the axle's moving back in case of the breakage of the main leaf. The tread of this axle is 55 in. at the front and 39 in. at the rear. The extremity of the body is pivoted on an upright from the axle, and steering is by means of the rear wheels.

An A. B. C. motorcycle type twin-cylinder air-cooled engine is used, and develops a nominal 9 hp. This engine has steel cylinders with machined fins, overhead valves, and very light reciprocating parts, and ball bearings throughout. There is a separate carburetor for each cylinder. The screw is mounted directly on the crankshaft and has a diameter of 55 in. with a pitch of 29 in. It is protected by a circular guard and a wire netting in front. There are double brakes on the front wheels, which are a special detachable type formed of a steel rim and aluminum disks. Tires are motorcycle size. Total weight, in full running order, is 490 lbs.

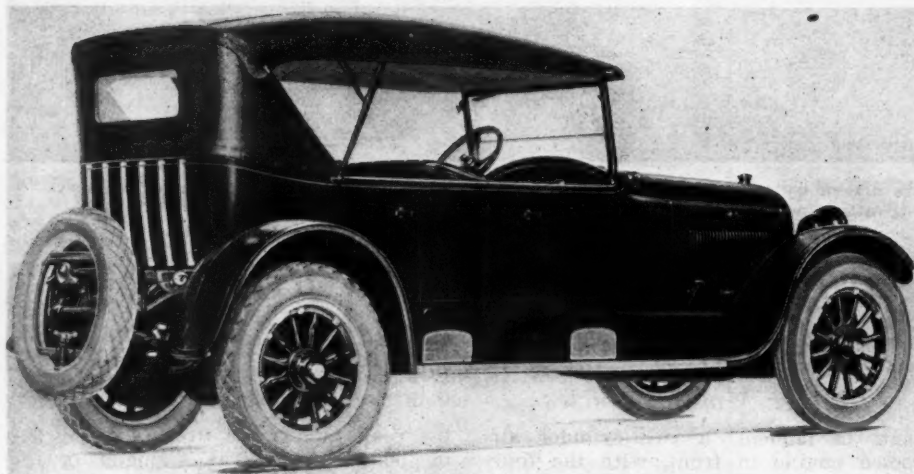
The claim is made that this type of car can be run over road surfaces impracticable to a heavy car. The cost of production is much less than for the cheapest type of car made in this country and running costs are less than for a motorcycle.



The Leyat is a two-seater with open body which also serves as a frame. Steering is done through the rear wheels

## Chassis Refinements on Cadillac Assure Economy of Upkeep

*Self-lubricated Bearings Take Place of Oil and Grease Cups at Certain Points. Body Lines Also Changed*



Cadillac phaeton, four-passenger, type 61

**C**ERTAIN chassis refinements in the new Cadillac Type 61 give assurance of greater economy of upkeep. For instance, the bearings on the clutch and brake pedal shafts, clutch release shaft and brake rocker shaft, formerly lubricated by oil or grease, have been replaced by bronze bushings with graphite inserts. There also is a new type of grease cup. A tight-fitting piston operating in a cylinder forces grease to the bearings under a pressure of between 300 and 400 lbs. per sq. in. The piston is connected by a small wing nut easily operated by hand.

That portion of the rear axle housing inclosing the gears has been reduced in size to permit the use of smaller wheels, with practically no reduction in road clearance. The tubular shaft by which the torque arm is attached to the axle housing has been increased in size and bearing area.

On the engine a conduit through the hollow camshaft carries oil which is fed through oil holes to the camshaft bearings and also lubricates the front end driving chains and air pump in the gasoline system. This arrangement does away with the oil tube above the camshaft and makes for a cleaner design. The splines on the camshaft driver have been lengthened to give greater bearing surface.

The water pump valves are no longer connected with the thermostats. This separation permits the valves to become self-aligning and results in better action. The valves still are thermostatically controlled.

The engine is equipped with a new design of carburetor, which provides for a 2-in. intake. A thermostat attached

to the auxiliary air valve spring automatically adjusts the spring tension to compensate for atmospheric changes. The action of the throttle pump is also controlled by a thermostat to provide

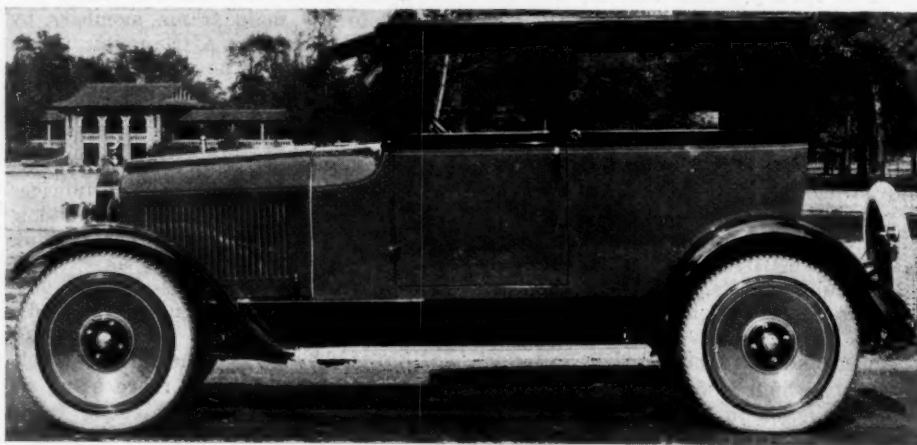
a richer mixture for rapid acceleration when the engine is cold.

Each water pump is fitted with a drain cock operated by a long shaft, readily accessible above the frame. This makes it easy to drain the cooling system.

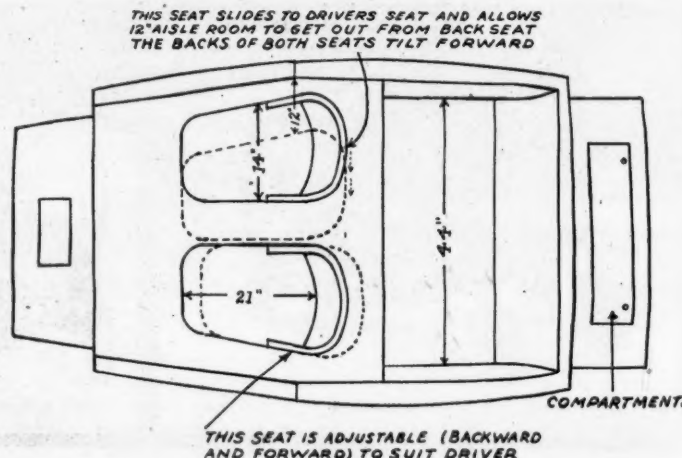
The hood is of sheet aluminum, lighter and more serviceable than steel. The latches are also made of a non-rusting aluminum alloy. One of the features of the instrument board is that all the devices are retained by thumb nuts to facilitate removal.

Outwardly Type 61 has been changed also. The radiator is higher and its shoulders have been raised and rounded to a more graceful pattern. The hood also is of more liberal dimensions. There is a new style of head and side lamps. The phaeton and five-passenger sedan are equipped with a trunk rack which fits between the tire carrier and rear of body. Six vertical strips of aluminum protect the rear of the body.

The prices are the same as for the present models.



The outstanding feature of the new Moon brougham is the seating arrangement in the front, as shown in the accompanying diagram. The doors on this car are unusually wide, being 32 in.





## MOON ADDS A BROUGHAM TO ITS LINE

*Seat at right of driver can be moved to left, giving 12 in. aisle room for passengers in rear to leave car*

**M**OOON has brought out a brougham, the outstanding feature of which is the manner in which the front seats have been arranged. The two front seats are of the bucket type. The driver's seat can be moved forward and backward two inches. This affords better control and ease of operation. The passenger seat or right-hand seat can be moved against the driver's seat, allowing 12 in. aisle room for passengers in the rear to leave the car.

This seat has two fixed positions and can be moved 12 in. from right to left, making it optional in placing the 12 in. aisle between or on the right of the two front seats. The backs of the front seats tilt forward.

The interior body is trimmed in silk-finished blue broadcloth, and the two doors have large pockets similar to an opera bag and are lined with blue silk. The back of each front seat is equipped with a silk robe rail, and the two rear quarter windows and the back windows have spring-roll curtains of blue silk. The floor carpet is blue, matching the curtains.

Interior hardware harmonizes with the trimmings. It is of the Colonial period design with French gray silver finish. Both door handles contain a locking device, the left door locking from the inside, and the right door on the curb or theft side being made secure from the outside with a Yale lock in the handle.

In addition to the light over the instrument board, this car is equipped with two small reading lamps on either side above the rear seat. They automatically light when the door is opened and can also be operated by a switch control on the side arm-rest.

A new window lifting mechanism does

away with the impractical features of the old chain and sprocket type. This new window lift operates with a worm gear, raising and lowering the windows smoothly and with greater ease. The windows themselves are channeled in felt guides. All four windows can be lowered. Rear windows lower three-quarters and front windows completely disappear into the door-wells.

The doors are flush. Both doors are 32 in. wide. The factory price on the brougham is \$2,785. Moon Motor Car Co., St. Louis.

### Some Mechanical Features of New Chevrolet

**H**EREWITH are two illustrations featuring some new mechanical constructions on the Chevrolet. The rear axle is now equipped with spiral tooth, pinion and gear and is stronger. There also is a new pinion thrust bearing installation, using annular bearings.

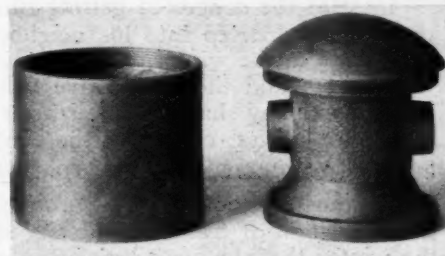
In order to insure engine and transmission alignment, these two units now are both assembled in a unit jig, said to give an alignment within .005 in.

There is a new arrangement of the hand brake lever and bracket, together with a new design of the pull rods and pedal parts.

The steering knuckle arms of the front axle are heavier than formerly and made with a tapered shank to fit into the steering knuckle. The king pins in the knuckles have been increased in diameter from  $\frac{1}{2}$  to  $\frac{9}{16}$  in. There also are hard rolled bronze bushings in the parts to accommodate the king pins. Taper roller bearings with smooth-bore cones are used on both outer and inner wheel

bearings. A grease cup is placed on the upper steering knuckle, making it more accessible and assuring lubrication to the upper and lower part of the king bolt.

The new car is fitted with a lower windshield, gypsy curtains, and lower front seat, and the cushions are placed at an angle. The upholstery is better and the gasoline tank capacity has been increased to 10 gal. The steering gear is shortened to accommodate the height of the driving seat. There are new push rods and tappets in the engine and new hood catches and brake brackets to support against the pull of the cables.



The shell and core of the ringless piston

### New Piston Eliminates Rings

**T**HE ringless piston is made in two parts, the outer shell or sleeve and the inner core. In assembling the piston the inner core is screwed into the shell, which is designed and machined to a true cylinder and is made from .002 to .003 in. less in diameter than the inside of the piston. The cylinder is filled by the oil film fed by the splash of the oil on the lower end of the cylinder wall, which works its way in partly by the action of the piston and partly by the capillary action of the oil.

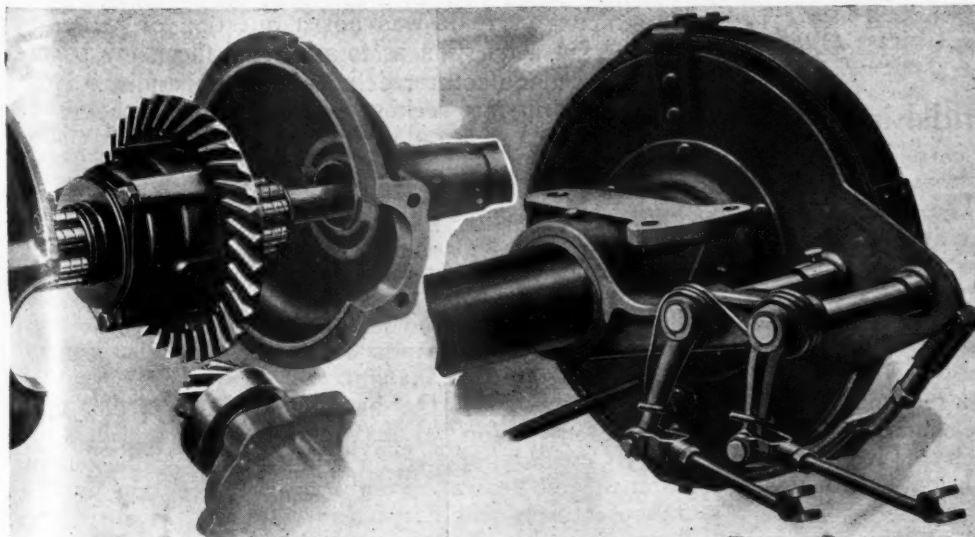
Naturally, it might be supposed that the pressure at the time of explosion would force out this oil film and that the power would be materially cut down by leakage into the crankcase. It is claimed, however, that the capillary action of the oil film is so short that the oil film is not disturbed under momentary pressure.

Inasmuch as the piston shell surface is always cylindrical because of the absence of rings, the oil film is unbroken and at no point do the metallic surfaces of pistons or cylinders come into contact.

With this piston shorter piston pins are necessary, inasmuch as the shell covers the core completely. Ringless Piston Co., Inc., 103 Park Ave., New York City.

### ONE WEAK DRY CELL OFTEN GIVES TROUBLE

One weak dry cell will many times give much trouble which is puzzling to locate. Each cell should be tested with an ammeter and should read not less than 15 amp.



Service men will observe the changes in the rear axle of the Chevrolet. Spiral gears now are used and there is a ball thrust bearing for the pinion thrust. At the right is shown the new arrangement of the brake levers.



# EDITORIAL



## Busy Season Ahead

**I**N the good old summer time the automobile is the favorite of everyone, for even the grouch who talks most of the danger of getting run over welcomes the opportunity to step into his neighbor's car and take a ride. But in the winter, often the tide of popular sentiment turns and the automotive vehicle seems to be a target for many shafts. One reason for this is that the legislative bodies, especially those of local jurisdiction, are much more active during cold weather.

It is during the winter that ordinances are drafted for the regulation of traffic on the city streets. It is during the winter that the state legislative bodies study how to increase the revenue from the automotive vehicle so that the politician may point with pride to his efforts in shifting the burden of taxes to the rich man.

Most plans for the taxation of automotive vehicles and for the regulation of taxes are based on merely passing observations of some ambitious legislator. This is the reason that so many of these proposals are unjust and, if made into laws, would seriously hamper the use of vehicles. Anything that unjustly hampers the use of automotive vehicles is a blow at our industry. The dealers and service men are the representatives of the industry in many communities and they should prepare themselves as spokesmen for the industry, just as the National Automobile Dealers' Association and other national organizations work for the benefit of the industry in national legislation.

Dealer and service organizations throughout the country should have their spokesmen selected to meet with fair statements and suggestions all such attacks, most of which originate through ignorance. Every local organization in the country should have an ambitious program mapped out for the winter, chiefly a program of education on behalf of their customers, which means, of course, for their own benefit.

## Value of Friendship

**L**ARK WASSON sells motor cars in a small city. Also he makes friends in that city, and these friends like to help him. The other day one of the cars that Lark sells had an anniversary, and Lark, like other good dealers, prepared to take advantage of it. Among other things he did, was to prepare a large advertisement for the local paper and to send over to the publication a roll of publicity that had been sent to him from the factory.

Soon after the publicity had been sent over, the editor of the paper called Lark on the telephone and told him he was not going to run the publicity. "It is too cold," he said, "and it does not reflect you or your methods at all."

Now really that publicity was not "cold." The trouble was that it had been made to blanket the entire country and had no more application to Lincoln than it did to New York. But Lincoln is a homey town and

the editor runs a homey paper. So he said to Lark:

"I would like to run something about your anniversary, if it was like you." Lark is a resourceful man, with a personality that fits into that sort of a community. So he met the reporter with a smile and gave to him the sort of a story about himself and the anniversary of his car that he thought fitted into the surroundings. Really it was a good story, too—the reporter must have been proud of it. And let us say here that the quality of the story is most often due to the inspiration at its source.

The result was that the editor printed every word of it and was glad to do it. The people read it.

Lark says in telling of this experience that the item—it was not a write-up—did more good than the ad. The point we wish to make is that the fellow feeling between man and man is the strongest bond, after all. The editor wanted to be helpful to his friend. Lark grasped the opportunity and profited. All were pleased.

Also this confirms something we have said previously about the publicity sent out in bales. This was a wise editor.



## Manufacturers Gaining Sight

**I**T is extremely interesting to note in the report of the meeting of the Motor and Accessory Manufacturers' Association at Detroit last week that SERVICE was the chief point of discussion; that speaker after speaker told the manufacturers of essential parts who were gathered in this meeting that they must keep in mind always the ultimate consumer.

The speakers who made these obvious statements to the manufacturers were surprised at the reception accorded them, chiefly because the reception this year was so different from the reception given to similar statements often made during recent years.

There is, of course, a different background. During recent years it was not a question of "How to Sell?" but a question as to which of the many buyers should a manufacturer deliver his merchandise. Now manufacturers are seeking a place to deliver the goods and a means of keeping these goods delivered; consequently, the man who has the most intimate touch with the consumer is in the limelight. This man is the dealer and maintenance man. His day in court has arrived and it is hoped that when he speaks, he will speak fearlessly and truthfully.

Dealers are very fortunate in that they have a spokesman already selected and equipped to represent them in such gatherings as that at Detroit. Harry G. Moock, general manager of the dealers' national body, knows well the handicaps of the dealer and the dealer's effort to make things go, regardless of the conditions imposed on him. Moock spoke out in Detroit and he was given a hearty reception by the manufacturers who listened intelligently, because they have been thinking of the dealer.

The day of the dealer has arrived. He must not abuse his present opportunity, but use it to build for all time.



## Enlists Dealers in Tax Revision Campaign

### N. A. D. A Backs Plan to Free Industry of Stigma Taxes

#### A. A. A. Also Endorses Proposal of Senator Smoot to Be Introduced in Senate Sept. 21

ST. LOUIS, Sept. 19—In its campaign to relieve the automotive industry of discriminatory taxes the National Automobile Dealers' Association through its general headquarters here has made an appeal to the dealers' and other associations throughout the country to band together in an effort to bring about the desired repeal of stigma taxes. In a circular to the automotive trade Harry G. Moock, manager of the N. A. D. A., says:

"Do you want to see industry freed from an unsound system which is delaying the return to normal business conditions?"

"There is only one way in which this can be brought about, and you must act at once if you hope for any relief."

"Senator Smoot of Utah has proposed the elimination of all discriminatory war taxes and their replacement by a manufacturers' tax levied on all commodities. This tax would amount to not more than three per cent, would be collected at only one point, and would be levied on all alike save for a necessary exemption for the small manufacturer or producer (such as the farmer) whose tax would not be equal to cost of collection."

The senator further proposes to reduce all revenue collections to six sources—personal income, corporate income, tariff, inheritance, tobacco, and the manufacturers' tax, thus bringing about a simplification of the entire tax system.

"While Senator Smoot himself would prefer a general turnover sales tax, the enactment of such a law is impossible now, in his opinion. The manufacturers' tax which he proposes, therefore, is a direct step toward non-discriminatory taxation and toward simplification. It will remove the brakes from business, increase consumption in those industries now discriminated against, and so increase consumption in other lines."

"If you want such a system of taxation you must act at once, as the Senate finance committee proposes to report a bill to the Senate Sept. 21."

"Write or wire your senators, stating your position. Take the question up with your local trade associations, chamber of commerce and others."

Washington, D. C., Sept. 19—Because it will not only eliminate the irritating nuisance taxes which now confront automobile owners when purchasing access-

ories for their cars, but believing that it will also have a stimulating effect on industry and help to solve the menacing national problem of unemployment, the American Automobile Assn., comprising about 700 state and local automobile clubs and representing the individual car owners of the country, has gone on record for a manufacturers' tax and to support a tax revision program involving the repeal of the special discriminatory war taxes now in effect.

The A. A. A. endorses substantially the proposals of Senator Smoot, who is soon to introduce a new tax bill as a substitute for the measure which has been passed by the House and is now pending before the Senate finance committee. These proposals include enactment of a new general manufacturers' tax; retention of present income taxes on individual, with revision of surtaxes; retention of the present income tax of 10 per cent on corporations; retention of existing taxes on tobacco, narcotics and oleomargarine, and retention of existing inheritance taxes.

The A. A. A. idea is that a manufacturers' tax would be imposed at only one point in the process of production; that is, when the manufacturing process is completed, so that the tax could not be pyramided or passed along to the consumer in expanded form.

### Automobile Underwriters in Conference with N. A. C. C.

New York, Sept. 19—The insurance committee of the National Automobile Chamber of Commerce and a committee representing the Automobile Underwriters' Conference held a joint session here recently to consider the evils which have grown up in automobile insurance. The N. A. C. C. committee presented to the underwriters additional facts in relation to its contention that the moral hazard has been ignored by the underwriters and that in countless cases cars have been insured for more than their value. There is evidence that the underwriters are beginning to recognize the validity of the N. A. C. C. contentions and that there is a gradual trend toward placing more emphasis on the character of the applicant for insurance.

### China to Hold First Annual Automobile Show in November

Shanghai, China, Sept. 17—China's first automobile show will be held in Shanghai in November.

The show will become an annual event and great preparations have been in progress to make it one of the most striking demonstrations the Republic has known.

The good roads movement in China is actively supporting the show.

### National Safety Council to Study Traffic Problems

#### Boston Congress to Give Special Session to Needs for Safety in Transportation

BOSTON, Sept. 17—With representative tire and motor industry officials as delegates and guests, and some of them as officials and speakers, the tenth annual congress of the National Safety Council here Sept. 26 to 30 promises unusual interest. There will be a special session of New England State Highway Department officials to discuss problems of uniform laws for that territory. There will be meetings every day for three days at the state house, and in every city and town special meetings will be held and a program of "No Accident Week" will be carried out. Jay Walkers will be tagged and speedy motorists and careless wagon drivers will be checked up.

The automotive section will have its first session Tuesday morning, Sept. 27, with Robert A. Shaw, of the department of safety and hygiene of the Ford Motor Co., Detroit, as chairman.

There will be three sessions of the rubber section under the direction of the following officers: chairman, E. H. Fitzgerald, Federal Rubber Co., Cudahy, Wis.; vice-chairman, E. W. Beck, U. S. Rubber Co., New York City; secretary, Ray N. Watson, Goodyear Tire & Rubber Co., Akron, O.

On Friday afternoon there will be a special session devoted to New England traffic problems. This was brought about by James T. Sullivan, motor editor of the Boston Globe and vice-president of the Bay State A. A., who secured the aid of the Safe Roads Federation.

Chairman John N. Cole, of the department of public works for Massachusetts, will preside. The program will be: "Handling Traffic During Highway Construction," Paul O. Sargent, chief engineer, state highway department of Maine; "Standardization of Motor Vehicle Accident Analysis," Frank A. Goodwin, registrar of motor vehicles, Massachusetts; "The Problem of Glaring Headlights," Professor William J. Drisco, Massachusetts Institute of Technology; "Training Men for Traffic Duty," Capt. Bernard J. Hoppee, Boston police department.

There will be a general discussion in which some of the executives from other states will take part as well as such men as President J. H. MacAlman, Boston Automobile Dealers' Assn.; President J. S. Hathaway, Boston Commercial Vehicle Dealers' Assn.; Amos J. Shorey, eastern district representative, N.A.D.A., and others.

## Has 930 Heavy War Trucks to Sell in United States

### Vehicles Are Reimported Army Units Gathered from Euro- pean Battlefields

NEWYORK, Sept. 17—The Slough Trading Corp. of America has been organized as representative in the United States of the Slough Trading Corp., Ltd., of England to dispose of approximately 1000 former American army trucks purchased of the allied governments and sent here for resale. W. O. Crabtree, who has been well known in New York for several years as a truck dealer, is general manager of the corporation, which is seeking dealer representation throughout the United States.

The trucks include Mack, Pierce-Arrow, White, Packard and Riker, and range in capacity from 3½ to 5 tons. They will be sold as reconditioned vehicles at approximately one-half the list price of similar new trucks.

The Slough Trading Corp. of America succeeds previous representation of the British company. It will handle only the distribution of the trucks, selling through local dealers in New York as elsewhere.

Speaking of the project, Crabtree stated his opinion that the truck business in the United States cannot be put upon a sound basis until these reimported trucks, which the entire business community knows are here and will be sold some time, have been disposed of. Up to date less than 70 of the Slough reimportations have been sold, and Crabtree feels that uncertainty will prevail in the truck market until the balance of the 1000 vehicles are put in the hands of users.

Crabtree makes no claim that the trucks are "as good as new," stating frankly that some have been operated and others have suffered sufficient deterioration in shipment and storage to necessitate reconditioning.

### SMALL CAR RACE IN ENGLAND

London, Sept. 12—The Junior Car Club, which was founded in 1912 as the Cycle Car Club, will conduct a 200-mile race on the Brooklands track, Oct. 22. It will be open only to members of the club, but will be held under the rules of the Royal Automobile Club. The race is divided into two classes for motor propelled vehicles. The first class will be for cars under 67.2 cu. in. and class two for cars between 68 cu. in. and under 91.5 cu. in. The race will be the first of its kind ever held in England. Fifty-one cars have been entered, representing 27 makes, of which 13 are in class one.

### SAYS PUBLIC CONTROLS PRICE

Milwaukee, Sept. 19—Milwaukee distributors and dealers look for a sharp accentuation of recent improvement in sales as the result of the general price

reductions announced by manufacturers, placing many list prices at or below pre-war figures. Discussing the situation, Tom C. McMillan, head of the Overland Wisconsin Co., and president of the Milwaukee Automotive Dealers Assn. said:

"The whole situation rested with the public, which refused to buy anything except of absolute necessity, because of high prices. Manufacturers have long realized this situation and governed themselves accordingly. As a result, our industry is resuming a healthy era. It took more than a year to bring it back.

"It is my opinion that interests which have held back from price reductions will soon be convinced that the buying public has a consistent unwillingness to buy anything except at prices which they think are right."

### HENDEE MOTORCYCLES DOWN

Springfield, Mass., Sept. 17—The Hendee Mfg. Co. announces a reduction of 22½ per cent in the prices on 11 lines of motorcycles. They are effective immediately. The company is bringing out a new machine called the "Indian Chief" which will sell for \$435. The report of the company for the fiscal year ended Aug. 31 shows that more than \$900,000 of bank loans were paid off during the year and that current liabilities aggregate only \$200,000 contrasted with about \$4,000,000 of current assets.

### YUBA TRACTOR LOWERS PRICES

San Francisco, Sept. 17—A five per cent reduction in price has been made on all tractors manufactured by the Yuba Mfg. Co. of this city. The new list prices are as follows:

Model 12-20.....	\$2,470.00
15-25.....	2,945.00
25-40.....	4,417.50
20-35 oversize.....	3,975.75
Rodebuilder.....	4,750.00

### ALLEN REDUCES PRICES

Columbus, O., Sept. 17—Effective Sept. 9, the new prices for the Allen line are as follows:

Touring.....	\$1195
Roadster.....	1195
Artcraft roadster.....	1495
Artcraft touring.....	1595
Sedan.....	1845

### VIM TRUCK DROPS PRICES

New York, Sept. 17—The Standard Steel Car Co., which now owns the Vim truck, has announced the following new prices:

Model	Old	New
Vim 29.....	\$1,355	\$1,050
Vim 30.....	1,550	1,175
Vim 31.....	2,475	1,975

### TEMPLAR AGAIN REDUCES

Cleveland, Sept. 18—Another price reduction of \$400 is announced by the Templar Motors Co. The open models have been reduced from \$2,385 to \$1,985, and the enclosed models from \$3,185 to \$2,785. The open cars now cost \$900 less than on June 30, and the enclosed cars \$1,000 less.

## Vail Lowers Half-Mile Dirt Track Record to 34.17 Sec.

### National Champion of Dirt Drivers Wins Four of Six Events at Byberry, Pa.

PHILADELPHIA, Sept. 18—More than 20,000 automobilists, mainly from Philadelphia, watched Ira Vail, Brooklyn, conceded the national dirt track champion, defeat a field of 14 crack drivers in the final day's racing of the Philadelphia County Fair at Byberry, Sept. 10. Driving an eight-cylinder Duesenberg car, Vail not only set the crowd wild with his spectacular driving, but he achieved a new mark that many have been trying to establish for years on the half-mile track. He turned the oval in 34.17 seconds.

Vail was not contented with this new record, and, despite strong opposition, managed to win all the events in which he was eligible to compete. He took four races, all told. Vail traveled the five-mile dash in 5:49.23; won the eight-mile race final after winning his two-mile heat trial and the five-mile handicapped event from scratch. The limit men had 25 seconds.

### New Driver to Contender

One of the newest drivers of A. A. A. races was Lew Fink, Philadelphia, a former heavyweight fighter. Fink drove a big Mercedes equipped with a 12-cylinder engine and gave Vail a hard run all the way. On the straightaways, Fink's car, which was given the title Cyclone, was like a streak of lightning, but on the turns he was slow. He had to go to the pit in the finals of the eight-mile race, tire trouble developing.

Horace P. Murphy, Syracuse, N. Y., was director of the racing and he gave the Quaker City a six-event card.

Vail's performance was above par in every way. His car broke down at Wilmington, Del., Sept. 9, and he and his mechanics had to work all night to get it in shape for Byberry.

### CALIFORNIA CLAIMS MOST CARS

San Francisco, Sept. 20—California now has more automobiles than any other state in the Union, according to a table recently published by the United States Bureau of Public Roads, covering motor vehicle registrations for 1920 throughout the United States. The Golden State now has 541,934 cars registered. Ohio is second with 538,090 and New York third with 524,271. Both New York and Ohio have greater numbers of motor trucks than California, but no state has a greater number of automotive vehicles of all types in proportion to population than California. California has one motor car to every five persons.

### WICHITA TRACTOR \$500 LOWER

Wichita Falls, Tex., Sept. 18—Wichita Motors Co. has announced a price reduction of \$500 on the Wichita tractor, model T. It will now sell for \$2,000.



## Modern Service Equipment For U. S. Mail Truck Fleet

New Methods Will Also Include  
Cost Accounting System for  
3600 Vehicles in Use

WASHINGTON, Sept. 19—Reorganization of the motor transportation system in the postoffice department has been authorized by Postmaster General Hays. He has designated Ralph E. Matthiessen, president of the Motor Haulage Co., New York City, as a special assistant in charge of the Bureau of Motor Vehicle Transportation, which will be established. It is the purpose of the Postmaster General to increase the efficiency of deliveries by motor trucks and to reduce the cost of transportation.

Matthiessen will confer with the automotive experts in the employ of the postal service and with manufacturers supplying trucks and cars to the government. He will reorganize the repair shops and extend their facilities through employing expert mechanics and garagemen. It is the intention of the Postmaster General to install a cost accounting system in order to determine the cost of operating the motor vehicle service. The latest labor-saving devices will be installed in the postoffice garages in the various cities.

There are now 271 cities in which government-owned motor vehicles are operated, maintaining over 3,600 motor vehicles. Its operating expenses annually amount to about \$15,000,000. There are nearly 5,000 supervisory officials, clerks, chauffeurs, mechanics, etc., employed in this class of service. About 25,000 tires are used for these trucks each year.

The motor vehicle service extends only to mail service within cities such as have collection and delivery of mail and transportation of mail from one point to another within cities. Rural carriers and contractors on star routes in rural territory operate their own motor vehicles.

Hays said: "The Post Office Dept. began operating its own machines on a small scale with the establishment of the parcel post. Its great expansion has been made possible through the large number of motor trucks received from the war department.

The growth of this motor service occurred under abnormal conditions, such as were produced by the war, and the tremendous growth of parcel post. Each large city built it up as a separate unit with a minimum of uniformity. Some few cities have splendid organizations and efficient service; many have been inferior and wasteful, due to lack of more uniform supervision."

### MUNGER GETS \$48,000 IN RIM CASE

New York, Sept. 18—The Federal Court of Appeals for the second circuit has handed down a decision granting \$48,000 damages to Louis D. F. Munger in his patent litigation against the

Perlman Rim Co., which has been in the court for several years. After the validity of the Munger patent had been sustained in the higher Federal courts, the master who heard the evidence decided that Munger was entitled to \$72,000 damages. The defendant then appealed on this point and the Circuit Court of Appeals cut the amount of damages to \$48,000.

Munger has similar suits pending against the Firestone Tire & Rubber Co. and the Goodrich Rubber Co. They were filed several years ago but have been held in abeyance pending the result of the suit against the Perlman Rim Co. Now that damages have been assessed in the original action the other suits will be pressed, according to W. A. Redding, attorney for the plaintiff. The Munger patent expired on Dec. 5, 1916.

## 10,614 Fewer Horses in New York City

NEW YORK, Sept. 16—Registered stallions in Wisconsin decreased from 2,437 in 1918 to 1,688 in 1920. In the state of Michigan they decreased from 1,288 in 1918 to 1,068 in 1919. Ohio had 965,000 horses in 1917 and 862,000 in 1919. It is hardly surprising, therefore, to discover that the New York City Board of Health's horse census, which will be released shortly, will show that there are today in New York City approximately 10,614 fewer horses and 1,784 fewer stables than in 1919.

## Hoover and Wallace Will Address N. I. V. A. Meeting

Chicago, Sept. 17—The twenty-eighth annual convention of the National Implement & Vehicle Assn. will be held at the Congress hotel, Chicago, Oct. 12 to 14 inclusive. The opening session will be convened by President W. H. Stackhouse at 10 o'clock, Chicago (daylight saving) time, Wednesday, Oct. 12, and the convention will be concluded with the annual banquet on Friday evening.

The more vital problems facing business generally and the farm equipment industry particularly, such as cooperation between government and business, agriculture, labor, transportation and finance will be treated by some of the best known authorities of the country, among them Herbert C. Hoover, secretary of commerce; Henry C. Wallace, secretary of agriculture; Wm. H. Barr, president of the National Founders Assn., widely known as a speaker on the open shop; Hon. W. P. G. Harding, governor of the Federal Reserve Board, and General W. W. Atterbury, vice president of the Pennsylvania railroad.

## 17% of Automobile Policies Canceled by One Company

Car Insurance Prospects Furnish  
Largest Percentage of Un-  
favorable Reports

NEW YORK, Sept. 18—Discussing the automobile situation which "continues to be the chief source of worry to the officers of many of the fire insurance companies," the New York Journal of Commerce says:

"Here and there is found a company which is not doing any serious worrying. These are mostly institutions which have not sought a large volume, but have applied to the automobile business the same methods they used in underwriting other classes. Realizing that the hazard was in the owner rather than in the car, they have investigated the owners through the 'Fire Record' mercantile agencies and various reporting agencies, and have kept off their books a considerable business which is now presumably causing sorrow to some of their competitors.

"One noteworthy feature of the automobile situation is the fact that it is so much worse in large cities than in the country and smaller places. After making due allowance for the greater prevalence of crime in large cities there is still ground for the belief that the better experience in the smaller places is due in part at least to the fact that the agents who underwrite the business know the assured, while in the large cities the underwriters, as a rule, know only the broker who presents the risk.

"A wide difference of opinion exists as to the value of inspections on assured. One official says that his company has had excellent results from the Retail Credit Co.'s investigations. An officer of another company says it has secured more satisfactory results through other agencies. Still another company uses the mercantile agencies first, because their reports cost less, and then the Retail Credit Co. later if necessary. That the system of getting reports on owners of cars is growing is evidenced by the expansion of this branch of the business of the Retail Credit Co. Vice President Walter C. Hill of that company writes:

"It is only within the last few months that fire insurance companies have been making anything like regular or systematic use of inspection information. During that time we have opened accounts with nearly a hundred fire companies for investigating automobile fire risks. This includes practically all the big companies. We have never handled any line of reporting in which there is such a large per cent of unfavorable reports. One company had us make a review of all its automobile fire business in Kansas City and found it necessary to cancel 17 per cent of the risks on its books. Similar reviews have been made in other communities with approximately the same results."

## 39 Chain Stores Caught in Consolidated Receivership

**With Assets \$3,500,000, Liabilities \$2,500,000, New York Dealer Lacks Working Capital**

NEW YORK, Sept. 18—D. W. Kahn, Robert B. Baird and A. J. Cohen were appointed receivers under a bond of \$50,000 by United States Judge Charles M. Hough for the Consolidated Distributors, Inc., in an equity proceeding last week.

The company operates 39 different stores for the distribution of automobile accessories and has its main office in Long Island City. The petition was filed by Chester D. Ireland, of Ridgewood, N. J., who alleges claims of \$24,000. The petition states that liabilities approximate \$2,500,000, with assets in the neighborhood of \$3,500,000.

At its incorporation the Consolidated Distributors, Inc., acquired the business of the Times Square Automobile Co. of New York, Pennsylvania and Missouri. It had an authorized capital of 300,000 shares of common without par value, and for the year ended Dec. 31, last, its net sales aggregated approximately \$5,456,000. Its balance sheet as of Dec. 31, last, showed inventories of \$4,178,000 and notes and accounts payable of approximately \$1,828,000.

### DETROIT STUDEBAKER IN NEW QUARTERS

Detroit, Sept. 18—The new sales home of Studebaker automobiles in Detroit was formally opened to the public Sept. 9, 10, 11 and 12. The new branch is a very modern three-story building, with 35,000 sq. ft. of floor space. The main floor room shows one of each of the Studebaker models. At the rear of the main floor is a large car delivery room. Here the cars from the factory are turned over to the buyers. Between the salesroom and the car delivery room are located the offices of Winfield S. Jewell, retail sales manager, and his staff.

On the second floor is another salesroom as large as the one below. This

room, the used car quarters, is splendidly decorated and has an abundance of light. The remainder of the space on the second floor is utilized by the general offices of the branch. The third floor provides a very large, splendidly lighted space for storage. There is also a paintshop on this floor where used cars will be repainted.

One of the interesting things about the opening was the showing for the first time of the new Big Six sedan and coupe. These two models are now being placed on the market for the first time, thus completing the Big Six line.

## Ansted Engines to Power New Durant 6-Cylinder Car

New York, Sept. 16—Announcement was made by Durant Motors, Inc., today to the effect that the Ansted engine manufactured by the Ansted Engineering Co. of Connersville, Ind., has been adopted for use in the Durant six-cylinder car which will be ready for the market by Nov. 1. Concerning the decision to use the Ansted type of engine, W. C. Durant said the selection had been made after canvassing the field thoroughly. Durant Motors, Inc., has the exclusive right by contract to the use of this engine. The Durant Six will be manufactured at Muncie, Ind.

### CHICAGO FIRE ANNIVERSARY

Chicago, Sept. 17—The fiftieth anniversary of the Chicago fire, Oct. 9, will be celebrated this year through an elaborate program lasting from Oct. 3, to 15, under the auspices of the Chicago Association of Commerce. The week of Oct. 9 is to be known as "No Accident Week" and the program for this period of the celebration will deal with safety, not only with respect to fire but with respect to all activities as related to life in a great city.

### BIG SHOW IN TEXAS

Dallas, Sept. 17—Forty different makes of automobiles, a dozen different brands of trucks and a variety of automobile accessories, tires, etc., will be displayed at the annual automobile show of the Dallas Automobile Trades Assn., held in connection with the State Fair of Texas here Oct. 8 to 22.

## N. A. D. A. to Add Empire and Keystone States to Roll

**Conference for Organizing Pennsylvania Dealers Set for Oct. 5—Moock and Drury in Charge**

CHICAGO, Sept. 19—Two more states will be added to the 26 that are already organized on a state basis and affiliated with the National Automobile Dealers' Assn. These states are Pennsylvania and New York, and steps already have been taken toward their organization, according to Harry G. Moock, general manager of the N. A. D. A., who was in Chicago this week attending the annual meeting of the Automobile Show Managers' Assn.

### Organization Can Effect Legislation

The preliminary conference for the work of organizing the Pennsylvania dealers will be held at Harrisburg on Oct. 5 under the chairmanship of George P. McFarland, Pennsylvania state vice president of the N. A. D. A. The call for this meeting has gone out. F. P. Drury, assistant general manager of the N. A. D. A., is taking active charge of the preliminary canvass in these two states and will spend much of his time in the immediate future in the work there.

Moock is quite optimistic as to results when the dealers are properly organized locally and then by state groups, and, through their state groups, effectively allied with the national dealers' body. It has been shown by the work already accomplished in states where this organization is effective that through it a greater interest in organization is stimulated and that helpful legislation and rulings are more easily obtained and harmful legislation more effectively opposed. These closely organized groups have come to have much influence in the matters of highway and traffic organization and regulation and have been quite effective in presenting their cause to the bankers and other business interests with which they come into contact. Also, through this machinery the various local associations are better informed as to the work being done by associations in the same district.

## Annual Outing of New York Dealers' Assn.



The annual outing of the New York Dealers' Assn. was held at Wagners farm, L. I., Sept. 13. The keynote of the entire day was the spreading of optimism and the breaking down of discouraging attitudes seen here and there in the industry. The hosts this year were Walter A. Woods, president of the organi-



## Morgan Is New Chairman of Executive Board of A. A. A.

With Headquarters in Washington, New Manager Will Devote Entire Time to Organization

NEW YORK CITY, Sept. 12—D. L. Morgan, business man of New Haven, Conn., has been appointed chairman of the executive board of the American Automobile Assn., succeeding Amos G. Batchelder, who held the position for many years and who was killed in an airplane accident in Maryland last May.

Morgan will devote his entire time to the work and will be located in the headquarters in Washington, D. C. He has been closely associated with motor affairs for eight years. For six years he was with the Lackawanna Motor Club, Scranton, Pa., and for the past two years, while living in New Haven, has organized the Automobile Club of New Haven. In business he has been associated with Bradley-Smith Co., confectionery manufacturers.

### FACTORY FOR "ROYAL SIX"

Montreal, Sept. 18—The Parker Motor Car Co., having a capitalization of \$10,000,000, has completed negotiations with Caron Bros. to lease from Sept. 1, sufficient space in the Longue Pointe works to provide for the assembly on a large scale of the company's car, the "Royal Six." The space leased is 64,000 sq. ft., with right to increase to 100,000 sq. ft. by May 1, 1922. The company estimates that 4000 cars per year will be turned out by the plant when in full operation. Active operation will, it is said, begin the latter part of October.

### McDONNELL HEADS KELLY PLANT

Springfield, O., Sept. 16—Production at the plant of The Kelly-Springfield Motor Truck Co. will be steadily increased as the volume of orders increases, according to announcement made by Edward O. McDonnell of New York City, newly appointed general manager. He took charge of the plant during the past week.

Accompanying McDonnell was Charles Willard Young of Emerson McMillan Co.,

New York City, who has been elected president of the Kelly-Springfield Co., succeeding Emlen S. Hare, who recently resigned. The other members of the Hare company have also withdrawn. Young and McDonnell upon their arrival here inspected the big plant, being escorted about by James L. Geddes, chairman of the board of directors, of this city, who has been in ill health for some time, but who is now feeling much improved.

## Tent 650 Ft. Long to House Big Birmingham Exposition

Birmingham, Ala., Sept. 17—Definite plans have been completed for the Birmingham Automobile Show, which will be held in conjunction with the Birmingham semi-centennial, Oct. 24 to 29 inclusive. Virtually all space in the large tent that will house the show has been taken. Tractors, ancient and modern cars, and nearly everything in the automobile line will be on display for inspection by President Harding and thousands of others who will attend the celebration.

The tent will be profusely decorated and the sides and walls will be covered with floral, cloth and paper designs. It will be a city block in length and the width of the street, which in Birmingham is about 75 by 650 feet. In the tent will also be held a fashion show and industrial exhibit.

No restrictions will be placed upon entries to the show except that the make of car be handled by a Birmingham dealer. E. W. Brownell, of the Brownell Auto Co., is chairman of the committee preparing for the show.

### TRY NEW TAX ON DEALERS

Portland, Ore., Sept. 17—Irrespective of the nature of the business done by them, many dealers in this city have been forced to pay a Federal brokerage tax of \$50 a year because they were dealing in second-hand cars. This brokerage tax applies properly only to dealers who accept a commission for selling cars, accepting them on a consignment basis. The question has been satisfactorily settled between the revenue collector and the dealers.

## Blames California Dealers for Lamp Law Violations

Head of Motor Vehicle Department Threatens to Revoke Licenses Unless Given Cooperation

SACRAMENTO, Sept. 17—After an appeal to automobile dealers of the state which, he says, was futile, Charles J. Chenu, superintendent of the motor vehicle department, has issued a notice to the dealers he will refuse registry to cars not properly equipped with lens that meet the requirements of the law.

Chenu asked the dealers to cooperate in order that danger from headlight glare would be minimized. But he says there has been little cooperation, and he now has warned dealers if they do not see that the cars are properly equipped when sold, license will be refused for their operation. His statement follows:

"It is a well known fact that dealers are delivering to purchasers motor vehicles with headlight equipment that is in violation of the Motor Vehicle Act.

"Carelessness of this character by dealers—turning loose upon the highways of the state vehicles with headlight equipment that is a menace to the motoring public—will not be tolerated by the motor vehicle department. Motorists are stopped upon the highways and placed under arrest for illegal operation, which is really due to ignorance of the law, the responsible party being the person who has sold and delivered the vehicle.

"Provision is made under Section 8 of the California Vehicle Act that 'if the department shall determine at any time that for any reason a motor vehicle or trailer is unsafe or is improperly equipped or is otherwise unfit to be operated, the department may refuse to register such vehicle and may, for a like reason, revoke any registration.

"This department desires the earnest cooperation of all dealers so that night driving on the highways of this state may be done with safety to the public and without danger of arrest to the operator for violation of the headlight provisions of the Motor Vehicle Act.

## Was a Boosters' Meeting Pure and Simple



zation, W. O. Crabtree and Harry Stratton, vice presidents, Albert Hirst, secretary-treasurer, Lee J. Eastman, Frank Carrie, I. C. Jones, George S. Morrow, Glen Tisdale and E. B. Jackson.

## Increase in Cotton Booms Automotive Sales in South

**Advance of \$40 a Bale in Staple  
Adds \$300,000,000 to Value  
of This Year's Crop**

ATLANTA, Sept. 20—The boom in cotton prices during the early part of September has proved an excellent tonic for the automotive industry throughout the south, and will, according to the consensus of Atlanta distributors, serve rapidly to bring the industry back to its normal status, if the cotton prices now existent hold for any length of time. In actual money volume the increase of more than \$40 per bale during the early part of the month means something like \$300,000,000 on this year's crop alone, to say nothing of the millions of bales of last year's crop that are still being held on southern farms and in the warehouses. With one of the shortest cotton crops in history there is little prospect of prices lowering for several months, while there is every indication that the staple will likely reach 25 cents per pound before the end of September.

This increase in cotton prices not only materially elevates rural buying power, so far as the automotive industry is concerned, but it has its very favorable effect on every line of commerce and industry throughout the entire south, primarily the retail business. It, therefore, increases the buying power of commerce and industry at the same time and this, in the opinion of the various distributors, will have the effect of materially stimulating the truck and commercial car business.

Automotive sales during August—and this was before cotton began its big advance—were better in this section than they have been in many months; and now with cotton having reached a substantial price September business in the automotive field will undoubtedly surpass the volume of any single month in more than a year. Already the advance is stimulating sales among the smaller dealers in the communities that depend mainly on rural trade, and marked improvement also is noted in the larger centers.

### DEALERS PROTEST PENDING LAWS

New Orleans, Sept. 19—Introduction of several bills by members of the Louisiana legislature now meeting in special session, has aroused widespread criticism among the automobile dealers of New Orleans. P. M. Milner, president of the Motor League of Louisiana, in a letter to the president of the Automobile Dealers' Assn., asserted that the proposed measures, if enacted into law, would treble and possibly quadruple automobile taxes in this state.

Former Governor J. Y. Saunders, who sponsored several of the bills condemned by Milner, addressed a general meeting of the Automobile Dealers Assn. at New Orleans, Monday, Sept. 12, in which he explained his plans for a state highway

department and a good roads program. He indicated to the dealers that he would join them in asking the legislature to modify some of the taxation features of the bills.

Under the new constitution the legislature must levy a minimum tax of \$15 on automobiles and \$25 on trucks. Ginger Abbott of the Abbott Automobile Co. spoke for the dealers at Monday's meeting, stating that the dealers would probably favor a tax of 25 cents for each horsepower and 25 cents for each hundred pounds carrying capacity.

## Hoosiers to Whistle to Tune of Law

INDIANAPOLIS, Sept. 17—*Operation in Indianapolis of motor vehicles which emit smoke or vapors offensive to the smell, or have attachments which make any musical or whistling sound or any loud or unusual noise, would be prohibited under penalty of \$100 fine or 60 days' imprisonment, or both, by an ordinance introduced in the city council at the request of Felix M. McWhirter, member of the board of public safety.*

*The bill also provides that all motor vehicles must be equipped with horns "or other lawful signaling device," but that no such device shall be used for other purposes than as a warning and signal to "persons, animals, vehicles or other objects about to cross its path, and at highway crossings and such other places as required by law."*

### CHAMPION BUYS JEFFERY-DEWITT

Toledo, Sept. 18—The business of the Jeffery-Dewitt Co., Detroit, will be taken over by the Champion Porcelain Co., a new Michigan corporation, organized here by the Champion Spark Plug Co., and capitalized at \$750,000.

The Champion company has held an interest in the Detroit concern for several years but has now bought the company outright. Insulators are made there exclusively for the Toledo spark plug manufacturers. The capacity of the Detroit plant is about 50,000,000 insulators annually. Nine hundred people are employed there.

Dr. J. A. Jeffery, well known ceramic engineer, who has developed a special type of insulator for this company, will remain as president of the new company. M. C. Dewitt will be vice president.

### JACKSON SHAFT TO SUPPLY TRADE

Jackson, Mich., Sept. 17—The Jackson Motor Shaft Co. of this city is making for the first time cam and crankshafts for Ford cars for distribution to the jobbers' trade. Until recently this company was operated exclusively for the Ford Motor Co., making parts for the Detroit Ford plant. The contract has expired and the company is using its large factory facilities to supply the trade in general.

## Automotive Industries Most Active in Canadian List

**Interesting and Valuable Data Presented to Dominion Manufacturers at Annual Meeting**

TORONTO, CANADA, Sept. 17—The annual event of the Automotive Industries of Canada, the N. A. C. C. of the Dominion, was held in Toronto, Sept. 8.

That conditions had been better than anticipated, that the products of the industry had enjoyed a better sustained demand than those of many other industries, thereby demonstrating their stability, that the service they gave was needed, and that conditions were bettering and the future assured, were the outstanding general opinions expressed.

Statistical data supplied by members of the association show that during the year 1920 a total of 97,868 motor vehicles were manufactured by 10 companies belonging to the automotive industry of Canada. These companies had a capital investment of more than \$43,000,000 and their production values totaled \$93,880,864. The figures for the entire industry showed a total of 21,940 employees at the busiest season, a total of \$23,826,240 in salaries and wages, a capital investment of \$87,158,869, and a production value of \$157,120,337 for the year 1920.

In addition, there were in 1920 a total of 5522 automobile dealers with 43,094 employees to whom \$56,022,200 were paid in wages. The total capital invested by dealers was placed at \$44,176,000.

The number of persons dependent on the automotive industries is shown in the chart as 87,760 and the number of dependent on the retail trade 194,464, a grand total of 282,224 dependents on the manufacture and sale of motor vehicles in Canada.

(These figures do not include service or gasoline stations, garages or repair depots. Were these included, it is estimated that the total would be swelled to approximately half a million dependents.)

The 1920 board was reelected, with the exception of R. E. Jamieson, who was succeeded by W. A. Eden of the Dominion Rubber Co. R. S. McLaughlin, president, General Motors of Canada, Ltd., was reelected president, and W. T. Sampson, general manager, Gananogue Spring & Axle Co., Ltd., vice president.

### INTRODUCES THE VAUGHN

Greensboro, N. C., Sept. 18—The American-Southern Motors Corp. is officially introducing its new model, the Vaughn, to the public, at the "Made in Carolinas" exposition this week. Hiram M. Browne is designer of the new car, which will be presented in two models, a sporting touring car and a racing roadster, and will sell for \$3,395. Another type of the Vaughn will be a family car, presented in three models and selling for \$3,995.



## Rochester Dealers Unite in Honest Buying-Selling Assn.

**Will Require That Members Follow Rules Sure to Leave Good Impression With Customers**

ROCHESTER, N. Y., Sept. 19—A new association, to be known as the Rochester Tire & Accessory Dealers' Assn., has been launched here with the object of checking dealers who attempt to dispose of merchandise in the tire and accessory business, which will not stand the test of honest advertising. A second plan of the new organization is to buy collectively in an effort to lower the price on many commodities.

A committee appointed at a previous session to go to Akron and other tire centers to get the best proposition that any manufacturer could offer to the members of the association was heard and the first concerted action of the association will be to place on sale in Rochester 30 by 3½ in. tires which will be guaranteed by the manufacturer and reputable dealers handling them. The 30 by 3½ tires were selected as a first example because it is realized that a man buying this size and hoping to obtain a bargain is often the very person who is least able to stand the loss sustained through the purchase of an inferior product.

Officers elected by the association are: president, Charles S. Owens, former sheriff; vice president, James Rutherford; treasurer, Henry Rowerdink; secretary, Grover C. Kingdom.

### DODGE BROTHERS IN CANADA

Windsor, Ont., Sept. 18—Dodge Brothers, Detroit, Mich., has leased a wharf building from the Canadian Pacific Railway in Windsor, Ont., and is assembling cars there. No official announcement of the company's plans for manufacturing in Canada has yet been made, but it is understood that a Canadian company is being incorporated and the location of a factory in one of the border cities is probable.

## Street Railway Breakdown in Des Moines Booms Fords

Des Moines, Ia., Sept. 19—It is difficult to make an accurate summary of automotive conditions in Iowa at the present time. On one hand the Herring Motor Co., long established Des Moines Ford dealer, reports that the month of August was the largest month that company has ever known. Another Ford dealer reports sales of 144 cars in Des Moines during the month.

The unusual Ford business cannot be entirely attributed to price reduction stimulation, as the last Ford cut did not come until late in August. Ford business in Des Moines seems to be better than it is in some other cities in Iowa. This may be accounted for partially by the fact that Des Moines has been without street car service since Aug. 3. It

is also admitted by dealers that many prospective buyers who in normal times would buy higher priced cars, want cheap transportation and are buying Fords.

There is no improvement in the condition of business among farmers, and dealers do not anticipate any for the immediate future.

C. L. Herring, of the Herring Motor Co., stated that the accessory business during the past 60 days has not held up with car sales. Repairmen and garagemen report the biggest business in their history, which is taken to mean that car owners are making major repairs with the idea of making cars go the limit.

## Ford Orders Increase 50% First Week of New Prices

Detroit, Sept. 19—The Ford Motor Co. reports an increase of 50 per cent in orders during the first week following their newest price reductions Sept. 2.

Orders had fallen off in August, due to late summer influences, and some slight stocking has been experienced in the company's 35 branches through the country. All of this stock was cleared out in this first week and deliveries already are running behind, especially on enclosed types.

The factory reports orders piling up to an extent that will practically insure capacity production on the present 100,000 monthly basis during September and October.

## Dealer Cooperation Works General Good in Danville

Danville, Ill., Sept. 19—Due to the activity of the automotive dealers in opposing the proposed ordinance governing gasoline filling stations, the city council of Danville, Ill., has amended the measure. It now reads that none of the present filling stations will be disturbed, but all future petitions for installation will be controlled by the new law. They will be restricted to certain streets, and the amount of gasoline which may be stored is also limited.

At certain points more than 50 gallons will be permitted, while at others 50 will be the maximum. As revised, the measure is satisfactory to the dealers. The Danville association is well organized, and when any proposition develops that is injurious to any member or the dealers collectively, the city council or other organization responsible is apt to be informed just how influential and aggressive the opposition may be.

### TO REDUCE TIRE RATES

San Francisco, Sept. 12—West bound railroad rates on tires are to be reduced as soon as the Pacific-West bound conferences complete present revisions, according to an announcement by E. G. Barnwell, assistant freight traffic manager of the Santa Fe Railroad. Permission has been asked of the Interstate Commerce Commission to publish a special rate to the Pacific coast terminals, reducing rubber tires from 75 cents to \$1 under the present rate per 100 lbs.

## China Finances Purchase of 3300 Multnomah Trucks

**Order Consists of Specially Designed Vehicles for State Aided Transport Lines**

SAN FRANCISCO, Sept. 17—The Shanghai Motors Co., of Shanghai, China, has placed an order with the Multnomah Motor Co., of Vancouver, B. C., for 3300 specially designed motor trucks. The order is subsidized heavily by the Chinese government, according to reports of the deal received by truck distributors in San Francisco, and the purchase is the largest made in one order from the Orient since motor vehicles were introduced there. The order calls for an expenditure of \$10,000,000 by the purchasers. It is understood that the trucks are to be used in government aided transportation systems operating out of Shanghai and Hongkong, China. It indicates that road building is proceeding more rapidly in China than has been reported hitherto, and that the government is taking a considerable interest in the problems of transportation and distribution.

More important than this, it shows a rapidly opening field for the sale of American automotive vehicles in the Orient. The Multnomah Motors Co. sent a motor truck expert to China while this order was being negotiated, to survey the field for which the trucks are wanted, and, as a result, has built a narrow-gage 1½-ton truck capable of traveling, with rugged endurance, the narrow trails beyond the completed roads in that country. The narrowness of construction is said not to interfere with ease of handling on narrow turns, or with freight carrying capacity. The company's plant at Vancouver is being enlarged to accommodate rush construction of the trucks, shipment of which to China is to begin Dec. 1 and proceed at the rate of 150 a month for 22 months. Robert E. Cavette is president and founder of the Multnomah company and the man largely responsible for the big sale in China is M. J. Briggs, general sales manager.

### DALLAS SERVICE ORGANIZES

Dallas, Sept. 17—For the purpose of a closer co-operation and of systematizing the business in Dallas to give the customers the greatest possible benefits for the least money, the automobile service station men of Dallas are forming an organization, which it is hoped, will eventually include every service manager in the city. Officers of the service men's organization are: N. H. Billman, Overland company, chairman, and J. R. Stoorza, Franklin company, secretary.

The Tariff Bill, which would reduce the import duty on automobiles to a uniform rate of 25 per cent and which would provide for a 5 ct. per lb. duty on aluminum instead of placing it on the free list or retention of the present duty of 2 ct. per lb. is asked by the N. A. C. C.

## Hoosiers to Call 47 Cars by First Name for \$500 Prize

### Indianapolis Automobile Trade Association Will Popularize Motor Cars in Newspaper Campaign

INDIANAPOLIS, Sept. 19—The Indianapolis Automobile Trade Assn., is sponsor for a campaign, beginning Thursday, that has for its purpose the reduction of automobile accidents in Indianapolis. It also will be a campaign of education in making the public more familiar with the automobiles that traverse the streets and boulevards of the city. Its chief purpose however, is to draw from the public its ideas on how to make walking and driving safer in Indianapolis. Prizes aggregating \$500 have been offered in the hope of creating greater enthusiasm for the enterprise.

John Orman, manager of the Indianapolis Automobile Trade Assn., is of the opinion that the campaign, which takes the form of a contest, will do much to reduce the automobile accident lists. "The big idea," said Mr. Orman, "is that our contest will cause discussion in every home. And when the folks talk a thing over around the table, naturally the discussion impresses itself on the minds of both childrens and grown-ups. That's why we are reaching into the home with this campaign of education."

### Contestants Make Suggestions

Beginning Thursday, according to the plans, there will appear in the Indianapolis News every publishing day for 31 days one or two pictures of well-known makes of automobiles. They will be numbered, but the name of the car will be nowhere visible. Each day the contestants will look at the pictures and try to name them. They will place the name opposite the number of the car and, at the close of the contest, file their answers with the Indianapolis Automobile Trade Assn. With the 47 names of cars—there will be 47 in all—the contestants also must submit a letter of not more than 50 words in which they will set forth suggestions for safety and the better regulation of traffic in the streets and boulevards of Indianapolis.

### DISPOSES OF BULL TRACTOR MONEY

Indianapolis, Sept. 17—Final disposition of the assets of the Bull Tractor-Madison Motors Corp. of Anderson, bankrupt, has been made by Harry C. Sheridan, referee in bankruptcy, in a ruling that Charles H. Jocknus, New York, and John F. Green, St. Louis, are entitled as bondholders to the proceeds from the sale of the property of the corporation. The amount of the fund that has been held in the Union Trust Co. by Fred C. Dickson, trustee in bankruptcy, is \$120,000, practically all of which was claimed by Jocknus and Green.

## CONCERNING MEN YOU KNOW

Richard C. Fowler has resigned as assistant sales manager of the Delco Light Co. to become vice president of Campbell, Trump & Co., advertising agency, of Detroit. Gage C. Tremaine has been named secretary of the company. With the addition of the new officers the agency name has been changed from Campbell, Blood & Trump to Campbell, Trump & Co.

W. A. Murfey has resigned as sales promotion manager of the Standard Motor Truck Co., Detroit. Previously he had served three years as sales manager for King Trailer Co., and before that time had been connected with several leading companies in a sales capacity.

L. W. Murphy has resigned his connection with the Olds sales branch in Detroit to join the Studebaker Detroit branch. Murphy at one time was cashier at the Olds factory.

H. P. Dawson, San Francisco, has been named district manager for the Willard Storage Battery Co. The district comprises Oregon, Washington and Idaho, with headquarters in Portland, Ore.

C. C. Hanch, vice-president of the National Automobile Chamber of Commerce and chairman of its taxation committee, will shortly become executive vice-president of the United States Automotive Corp., with headquarters at Connersville, Ind. Hanch will have active charge of the operating policies of the company, which has as subsidiaries the Lexington Motor Co., the Ansted Engineering Co., the Ansted Spring & Axle Co., the Connersville Foundry Corp., the Fayette Painting & Trimming Co., and the Teetor-Hartley Motor Corp.

Charles B. Tamm, Milwaukee, for several years chief purchasing agent of the LeRoi Co., manufacturer of passenger and commercial car and tractor engines, has resigned to accept the position of assistant general manager of the Hydro-Hoist Co., which is affiliated with The Heil Co., Milwaukee, manufacturing motor truck dump bodies, truck tanks, etc. Mr. Tamm was associated with The Heil Co. prior to joining the LeRoi company.

Peter Entringer, for three years secretary of the Johnson Motor Co., Fond du Lac, Wis., has resigned to form new connections. He is a pioneer dealer of Wisconsin, having been for 12 years in business at St. Cloud, Wis., before joining the Johnson company.

Earl F. Berry, formerly of the sales staff of the Reeke-Nash Co., Milwaukee, has acquired an interest in the Milwaukee Oldsmobile Sales Co., and becomes secretary and treasurer.

Louis F. Hoffman, for several years manager of the service department of the Midwest Engine Co., Indianapolis, died at his home recently following an illness of many months.

H. E. Rice, former commercial manager of the Atwater Kent Mfg. Co., has resigned to become associated with the American Bosch Magneto Corp., as assistant to Arthur T. Murray, president of the corporation.

J. R. Hoffman, formerly connected with The Norwalk Tire & Rubber Co., Norwalk, Conn., has been made district manager in Pennsylvania for the Indian Tire & Rubber Co.

Lynn L. Whaley, formerly with the International Harvester Co., has become Toledo distributor for the Acason trucks. He will have a direct factory connection. A service station will be opened in connection with the new sales headquarters.

L. J. McCracken, who recently established a sales record for Overlands at Bridgeport, Conn., will assume management of retail sales at Toledo, succeeding Lewis P. Kinsey, on Oct. 1. Kinsey, who has been long identified with Overland, is leaving the motor field. McCracken was formerly in the New York sales of Willys-Overland.

Oscar P. Pearson has joined the staff of the N. A. C. C. in the capacity of an industrial expert. He was lately with the Carnegie Institute.

H. A. Holder remains as president of the reorganized R. & V. Motor Co., and the executive staff and directorate is not altered though G. L. Walker, who has been assistant secretary and treasurer, becomes also assistant to the president. Gust Olson, Jr., is elevated to chief engineer; A. A. Gustafson becomes general superintendent or works manager; and D. M. Beal, former assistant sales manager, assumes responsibility for the finished car, a department which embraces chassis test, painting, trimming, assembly and final test.

W. Clark Little has been made advertising manager of the Anderson Motors Co., Rock Hill, S. C.

H. A. Coffin, who recently retired as manager of the Distel Wheel Division of the Detroit Pressed Wheel Co., has joined the Cadillac Motor Co. as assistant to H. H. Rice, president.

Frank W. Beirn, sales manager of the White company, Philadelphia, has been transferred to Wilmington as manager there; J. Louis Klee, formerly Wilmington manager, comes to Philadelphia in a special capacity, and C. W. Squires, Jr., has been appointed territorial manager in Philadelphia. He was formerly doing export work at the factory.

George Neill, former motor car dealer, connected with the Los Angeles Locomobile agency for several years, will assume charge of the new San Francisco factory branch of the Leach Biltwell Motor Car Co., Los Angeles. Neill will take charge of the salesroom on its opening, about Oct. 1.

W. Russell Baird, for the past eight years president of the Baird Tire & Supply Co., Norwich, Conn., has retired and is succeeded by Wilbur S. Williams. The present name of the Baird concern will be changed to The Williams Tire & Supply Co., and the officers will be: Wilbur S. Williams, president, Charles B. Gilbert, treasurer, and Meredith Lee, secretary.

Hatch Motors Co., Philadelphia, distributor of the Hupmobile and Marmon cars, has appointed John A. Midlar manager of retail sales. Midlar continues his work with the company as sales extension manager in charge of advertising. Prior to associating himself with the Hatch company, Midlar served as sales promotion manager for the Guy A. Eddley Motor Co., distributor of Paige cars, as well as advertising manager for that concern, and for Grieb & Thomas, distributor of Briscoe and Kissel cars.

J. F. Nolan has been made general manager of the recently formed Philadelphia Roamer Co., Philadelphia.

Albert Champion, president of the Old Timers' Club, composed of men of the automotive industries who have seen continuous service for five or more years, is in conference with chairmen of the various committees, and preparations are under way to start a membership drive which will bring the organization up to the standard set by the officials last spring.

P. E. Bates, for the past five years with The Mohawk Tire & Rubber Co., Akron, has identified himself as district manager with The India Tire & Rubber Co. of that city.

Lewis H. Kittredge, president, Peerless Motor Car Co., has been actively associated with Peerless products for the past 24 years. Other records of continuous service in the Peerless organization follow: W. F. Henderson, credit manager, 23 years; W. H. Staring, second vice-president, 21 years; A. F. Misch, general superintendent, 20 years; F. G. Weaver, office manager, 20 years; D. F. Rouse, cashier, 19 years; E. H. Calvert, secretary and treasurer, 18 years; Robert Acuff, assistant general superintendent, 16 years; R. J. Schmunk, general sales manager, 14 years; A. L. Neal, chief draughtsman, 14 years; F. W. Slack, assistant chief engineer, 12 years; R. R. Abbott, metallurgist, 12 years; W. R. Strickland, chief engineer, 11 years; E. D. Pugh, service manager, 10 years; W. W. Lewis, assistant general sales manager, 10 years.

### EQUIPMENT MEN ELECT

Dallas, Sept. 17—The interests of the accessory dealers of this section of the country were discussed at a meeting held here recently when the Southwestern Equipment Assn., formerly the Southwestern Automobile Equipment Jobbers' Assn., met here to discuss con-

ditions and elected officers. There are 25 members of the organization and reports showed the business done by them last year amounted to more than a million dollars. F. A. Ferris, Dallas, was elected president; Joe L. Ward, Waco, vice-president, and Sid J. Stuart, Dallas, secretary-treasurer.



## IN THE RETAIL FIELD

Payne Sales Co. of Raleigh, N. C., has been chartered to do general automobile sales and repair business. Authorized capital stock is \$125,000. Incorporators are C. A. Payne, Maggie R. Payne and B. R. Poole, all of Raleigh. The company will handle the Paige and Scripps-Booth automobiles.

Gate City Motor Co., Greensboro, N. C., which recently purchased the garage of the High Point Motor Company, has taken charge of the establishment. The new company is dealer for the Cole 8 and Studebaker cars and Firestone tires.

Booth-Newton Motor Co. is a new concern in Charlotte, N. C. The company will handle Chalmers and Maxwell cars for this territory. The new firm is composed of J. L. Booth and C. E. Newton. Mr. Booth was for a time territorial supervisor of the B. and B. Motor Co., former distributor of Chalmers and Maxwell cars here. Newton was for years sales manager of the B. and B. company, and before that spent some ten years with the Maxwell and Chalmers factory organizations.

B. H. Blalock has taken over the interest of A. H. Kne in the Ford agency operated by them jointly in Charlotte, N. C., for several months. The company will hereafter be known as the Blalock Motor Co.

Koehler-Rahn Co., Milwaukee, has been appointed distributor of the Moon in Wisconsin and northern Michigan. The concern also is distributor of the National and the Elgin Six.

C. G. Jenks of the Jenks Motor Sales Co., Quincy, Ill., has taken over the Packard-Paige sales agency. Dwight Hoover will be in charge of sales and E. K. Woolley will be service manager.

Giant Storage Battery Co., Hartford, Conn., entertained a number of sub-dealers at a dinner at the Elm Tree Inn, Farmington, recently.

Ward-Battle Motor Co., recently organized to distribute the Maxwell and Chalmers cars in St. Louis and adjacent territory, opened its permanent headquarters with a banquet to dealers and employees. E. W. Clark, director of sales, and W. J. Mattimore, advertising manager, both from the factory, were present at the opening.

Keystone American Motor Co., Philadelphia, of which Francis E. Fanning is president, and George A. Brower, sales and service manager, has been appointed distributor for the American Six. This concern also is distributing the Cunningham car.

Ford Dealers—One new Ford dealer has been authorized for Portland, Ore., and has already opened, while another will open in October, raising the number of authorized dealers from six to eight. The firm already started in business is Armentrout and Wicke, which is moving into a new building in the extreme eastern section of Portland.

Al May, Newberg Ford dealer, will be the eighth Ford dealer for Portland, Ore., and will move here from Newberg in October. A building is now being erected for him in the extreme northern section of the city, hitherto without a Ford authorized organization.

Gear Shop, handling a complete line of spiral and straight bevel gears, transmission gears, small differential gears and axle shafts for all cars, has been opened for business in Philadelphia.

Overland Richmond Co., Richmond, Ind., has removed to the K. of P. building on the floor formerly occupied by the Midwest Auto Co. The company will handle the Willys Knight and Overland automobiles, and will take care of storage, repairs and accessories.

Lathrop-McFarland Co., retail dealer of Indianapolis, has taken over the distribution of the Oldsmobile. The company is also distributor for the Cole and Liberty.

Eugene B. Smith Co., Greenville, S. C., distributor for Packard and Paige automobiles, will occupy a new building, contract for which has just been let. The building will be modern, fire-proof, and will afford ample facilities.

E. T. Lewis, Danville, Va., has bought the R. K. Motor Co. and will take charge of the business immediately. The business will be operated under the same name and handle the same line of cars as heretofore. C. H. Rawls, who has been in charge of the R. K. Motor Co., goes to Raleigh, where he will conduct the affairs of the Rawls Motor Co., selling Ford cars.

C. & M. Motor Co., Greenville, S. C., has secured the agency for the Chalmers and Maxwell cars for Greenville and Pickens counties. Guy Brown and James Anderson are the owners of the C. & M. Motor Co.

Roberts-Laughridge Motor Co., Shelby, N. C., has taken the agency in this territory for the Willys-Knight and the Overland cars.

Babe Ruth, home run champion of the New York Americans, has applied for a dealership in the new Rickenbacker Motor Co., the company has announced. Applications for territory in the new organization are reported to be numerous. A list of dealers, however, will not be given out until just before the New York automobile show in January. Barney Oldfield has also applied for a dealership, says the company.

Edward R. Bacon Co., construction equipment, has opened a shop and salesroom at 735-37 Folsom street, San Francisco, for the distribution of motor truck equipment.

Colyear Motor Sales Co., San Francisco, with branches up and down the coast, announces that it has been appointed distributor in that territory for the universal joints and cone clutches made by the Hartford Automotive Parts Co.

Whitcomb & Smith, San Francisco, has been named distributor of Westinghouse storage batteries for northern California, Nevada and Hawaiian Islands, with headquarters in San Francisco.

Reo passenger cars and speed wagons will be distributed in Alameda and Contra Costa counties, California, and virtually all the eastern shore of San Francisco Bay, by the H. A. Hine Co. This announcement was made by P. L. Emerson, president of the Reo Motor Car Co. of California, recently organized by factory officials to take care of distribution in California and the Orient. The Hine company will have headquarters in Oakland.

Moreland Motor Truck Co. has separated its manufacturing and selling organization by the formation of a new corporation under the name of the Moreland Sales Co., of which Watt L. Moreland, general manager of the Moreland Truck Co., is president.

Matthews-Neitzel & Co., Milwaukee, Chevrolet dealer, has changed its corporate style to Neitzel-Wussow & Co. R. J. Wussow is secretary.

Northland Motors Co., Menominee, Mich., has been granted a charter to do business in Wisconsin. It is a Michigan corporation with \$65,000 capital stock, of which \$32,000 will be used in Wisconsin. The local headquarters are in Milwaukee, with Henry N. Gilbertson as manager. The company distributes the Cletrac tractor and Oliver tractor implements.

Jay M. Shepard, Waterloo, Wis., Reo dealer, has also been appointed Studebaker dealer.

Mitchell Auto Sales Co., Madison, Wis., has moved its salesrooms from 112-114 West Franklin street to new and larger offices at 458 West Gilman street. The service department will be continued at the former location. G. E. Teckmeyer is general manager. The company was originally a Mitchell dealer in Dane county, but has now been given a distributing franchise for a considerable territory in western Wisconsin.

Ira H. Meyers, Stevens Point, Wis., has been appointed Nash dealer and has formed the Nash Sales Co. to handle the business.

Edison Tire & Rubber Co., Chicago, has opened a direct factory branch in Milwaukee, in charge of Benjamin Kaplan.

Herrick-Koss Auto Co. has succeeded W. H. Evans as Ford dealer at Waterford, Wis.

Burwell-Walker Co., Charlotte, N. C., distributor for Dort cars in North and South Carolina, will move into its new building about Nov. 1.

## Durant Said to Have Eye on Peerless Motor Car Co.

### Officials of the Cleveland Company Refuse Either to Affirm or Deny Rumors of Sale

CLEVELAND, Sept. 1—Reports have been current in Cleveland that an announcement would be forthcoming soon concerning the sale of the Peerless Motor Car Co. to W. C. Durant of Durant Motors, Inc., and it was expected that the announcement might follow a meeting which was to have been held Sept. 13. The meeting, however, did not materialize.

B. G. Tremaine, president of the Peerless company, attended a meeting in New York Sept. 13, but other officers of the company have declined to state what subject was taken up.

The report of the sale which has been in circulation is responsible largely for the increase in Peerless stock, which has gone up from \$25 a share to \$40. The Peerless company is a \$10,000,000 corporation and the Peerless plant in Cleveland covers 20 acres. The company is the only one here which manufactures an eight-cylinder car. It is said that if Durant takes over the company, production will be doubled.

## BUICK RETAIL SALESMEN ORGANIZE

Atlanta, Sept. 18—A permanent organization of Buick retail salesmen was formed at a meeting of the company's southeastern representatives held at the Atlanta Chamber of Commerce Sept. 6 and 7, the organization being divided into two separate groups. The first group was definitely formed at the Atlanta meeting, and the second group is to be formed at a meeting to be held in the near future at Chattanooga, Tenn. Meetings of the retail salesmen are also to be held at Montgomery, Ala., and Daytona, Fla., during the next month.

These organizations will comprise retail salesmen only, representing the company's various dealers and distributors in the southeastern area in the territory covered by the Atlanta branch. Officers of Group One were elected as follows: C. S. Culver, Gadsden, Ala., president; E. T. Brigham, Dublin, Ga., vice president; E. W. Tomlinson, Atlanta, secretary; directors, J. B. Friday, Charleston, S. C., J. Leon Prior, Madison, Ga., and G. W. Brooks, Macon, Ga.

Members of the retail sales forces of the Buick dealers are now taking a complete course in retail salesmanship written and devised by Benjamin Ulmer, assistant manager of the Atlanta branch.

## WASHINGTON FAIR IN OCTOBER

Puyallup, Wash., Sept. 17—An added feature to the twenty-second annual Western Washington fair to be held here Oct. 3-9, will be the automobile, truck, tractor and accessory exhibit. William J. Coyle, manager of the last two Seattle automobile shows, has been retained to take complete charge of the exhibits.

## OSHKOSH TRACTOR IS BUILDING

Oshkosh, Wis., Sept. 19—Excavation was started Sept. 15 for the new works of the Oshkosh Tractor Co. of Oshkosh, Wis., which was organized some time ago with \$1,200,000 capital, to take over the entire business of the La Crosse (Wis.) Tractor Co., and will transfer it to Oshkosh. The main building will be 150 by 500 ft., of brick and steel, with saw-tooth roof, and a wing 25 by 100 ft.,

as a motor testing room, and a two-story office building, 40 by 88 ft. It is hoped to get the new works into running order by Nov. 1 or 15. L. W. Melcher, who was factory manager for the La Crosse company, has accepted the same position with the new organization. A. D. Paine of Oshkosh, who handled the distribution of the La Crosse tractor in the northwestern territory for many years, is president of the new company.

## BUSINESS NOTES

**Alemite vs. Rimtco.**—The difference over the patent rights involved between the Bassick Mfg. Co., Chicago, manufacturer of the Alemite system of lubrication, and the Rhode Island Machine & Tool Co., Woonsocket, R. I., manufacturer of the Rimtco high pressure system of lubrication, has been settled to the satisfaction of all concerned. The Rimtco gun will be manufactured, as heretofore, by the Rhode Island company, but under an agreement with the Bassick company, which gives the former full rights to manufacture and sell the Rimtco pressure grease gun.

**Jordan Motor Car Co.** has declared its regular 1 1/4 per cent quarterly preferred stock dividend, payable Sept. 30 to stockholders of record Sept. 20.

**Nash Motors Co.** in August had orders 50 per cent in excess of production. Both the Milwaukee and Kenosha plants are making every effort to catch up with the demand, and indications point to an unusually busy fall.

**Adams Trailer Corp.** is moving to Hammondsport, N. Y., where production of trailers will be started. The company officials report a demand for trailers and camping outfits from persons planning to winter in the South.

**Automatic Oxidizer Co.,** Columbus, O., has placed on the market an automatic oxidizer.

**Franklin car price cuts,** effective Sept. 1, were responsible, within an eight day period immediately following the reductions, for a 94 per cent increase in factory shipments over the same period preceding the decrease.

**Gary Trucks**—A deal for a modern plant here has been closed by the Gary Motor Truck Co., Gary, Ind., and Gary trucks will be manufactured in Toronto for the Canadian export market. The Canadian company in conjunction with the American Gary company will be composed of Canadians. The organization of the factory sales forces will be carried out under the personal supervision of Frank Dawson, president of the Gary company.

**Twin Ports Steel & Tractor Co.,** Superior, Wis., has recently been changed to Twin Ports Steel & Machinery Co. to better designate the nature of the business. While the company is still manufacturing tractors, it is interested more particularly in the production of parts for tractor manufacturers as well as makers of other machinery, vehicles, etc.

**Titan Truck Co.,** Milwaukee, manufacturer of Titan motor trucks, has made an increase in its capitalization, which now consists of \$100,000 of common and \$50,000 of preferred stock. The new issue is made to finance the development of the business. Joseph C. Millmann is president and general manager.

**Five Ball Spark Plug Co.,** Milwaukee, has been incorporated and capitalized at \$100,000 for the purpose of manufacturing and marketing spark plugs. The incorporators are Louis Neeb, A. J. Schneider and Edward C. Kahn, Milwaukee.

**Oneida Motor Truck Co.,** Green Bay, Wis., manufacturing Oneida motor trucks, gas and electric, has made a new issue of \$1,000,000 of 8 per cent serial gold bonds to finance more adequately the operation of the business.

**Perfection Hoist & Engine Co.,** Milwaukee, has decided to establish permanent works and headquarters in Two Rivers, Wis., and has taken over the plant and equipment of the Two Rivers Plating & Mfg. Co., which now occupies its new works. Walter F. Mayer, Milwaukee, is secretary of the company.

**Victor Krefl Mfg. Co.,** now located at Two Rivers, Wis., and manufacturing shock absorbers, spotlights and other automotive equipment, will transfer its headquarters and plant to Eagle River, Wis., on Oct. 1 or as soon as a new factory can be completed.

**Gem Gasoline Lock Co.,** Columbus, O., is the name of a new concern which manufactures a patented lock for the gasoline line for motor vehicles. Oscar Redman is manager.

**Fordson Tractors**—Production of Fordson tractors at the River Rouge plant from March 1 to Aug. 1 totaled 26,000. In August the 200,000th Fordson was built and will be kept at the plant as an emblem of the growth of the tractor business since its inception.

**May Body Co.,** Toledo, builders of truck bodies, whose plant was burned a few weeks ago, has taken a lease on the plant formerly occupied by the Toledo Bending Co.

**Coast Tire Co.'s** plant is now in operation in Oakland, turning out 200 tires daily, having been opened with a banquet on Sept. 1.

**Durant Motors** has contracted with the United States Automotive Corp., Connerville, Ind., for 3000 Anstead engines, 2500 to be delivered at the Muncie plant by Jan. 1.

Robert E. Cowden has been appointed receiver

for the Master Tire & Rubber Co., Dayton, O., a \$1,000,000 corporation. His bond was fixed at \$25,000. Application for receiver was made by the Jenckes Spinning Co. of Pawtucket, R. I., the largest creditor. The Master company is one of five Dayton corporations which tried to re-finance themselves through the French-Worthington "swindle gang."

**Firestone Tire & Rubber Co.** has decreased production from 28,000 to 25,000 tires a day to conform with a decline in sales. The slump is seasonal and has been expected. Further reductions in output will be made as sales fall off with the end of the touring season.

**Automobile Sundries Co.**—Schedules in bankruptcy have been filed by the Automobile Sundries Co., Inc., of New York. Liabilities are listed at \$80,026 and assets at \$60,789. The principal creditor is the Champion Spark Plug Co., which has a claim for \$29,506.

**John N. Willys** announced after a conference with other members of the executive staff of the Willys-Overland Co. that 2500 additional men would be placed at work in the plant and that an equal number would be called up within another week.

**Ford Motor Car Co.**—Reduced prices in Ford cars and trucks followed a series of negotiations between the company and the companies supplying it with parts, by which new price arrangements were made in practically all cases, and orders placed ahead for several months' supply.

**Duplex Truck Co.**—Operations at the Duplex Truck Co. factory, Lansing, have increased to a 50 per cent basis through the development by the company of the possibilities of its 1 1/2 to 2-ton chassis for passenger bus service in meeting transportation problems in many parts of the country.

**Matt F. Ross Mfg. Co.,** Kokomo, Ind., capitalized at \$50,000, which has filed articles of incorporation, will manufacture a front wheel drive for automobiles. Ross has secured a patent thereon.

**E. A. Nelson Automobile Co.** has filed a petition in the Federal Court, Detroit, asking that it be adjudicated bankrupt. This action was taken following a meeting of directors at which the company was found to be in an insolvent condition. Assets of the company, including patents, trademarks, development work, etc., are listed as \$501,013.56. Cash in bank is given as \$25. Liabilities total \$122,207.62. The E. A. Nelson Automobile Co. took over the affairs of the E. A. Nelson Motor Car Co. on March 23, 1920, after the latter company had been adjudged bankrupt.

**Cadillac Motor Car Co.** has resumed production on a schedule as great as that of last year, it was announced at a convention of Cadillac's 100 distributors at the factory recently. In 1920 annual production was on a basis of 20,000, representing practically 100 per cent capacity.

**Mercer Motors Co.**—Reorganization of the Mercer Motors Co. has been completed by the private sale of \$2,000,000 in 7 per cent, 4-year notes and \$500,000 in 20-year first mortgage bonds. In addition, 100,000 shares of voting trust certificates have been disposed of, making 200,000 shares of these certificates outstanding. The corporation's balance sheet shows current assets of \$2,265,767 and current liabilities of only \$334,107.

**Willys-Morrow Co.,** Elmira, N. Y., a subsidiary of the Willys-Overland company, which manufactures parts for Overland cars, has called back to work 2000 former employees. The plant had been closed for several weeks.

**Portage Rubber Co.**—Stockholders of the Portage Rubber Co. have made plans for reorganization and refinancing under new management by the issuing of \$1,000,000 in first mortgage sinking bonds. It is expected that E. A. Tinsman, former manager, will be elected vice-president and general manager under the reorganization.

**Charles B. Shanks,** vice-president of the Anderson company, formerly of the Class Journal Co., will have charge of the metropolitan headquarters.

### NATIONAL ELECTRICAL SHOW

New York, Sept. 19—The Annual Electrical Show, at which the electrical motor truck manufacturers will take an important part, will be held in the Seventy-first Regiment Armory, opening Sept. 28. During the post-war period electric trucks have progressed to a marked degree and the display this year will be exceptionally interesting.

## Complaints Lead N. A. C. C. to Investigate "Pirate Parts"

### Reputation of Many Motor Vehicles Injured Where Maintenance Has Relied Upon Substitutions

NEW YORK, Sept. 19—Directors of the National Automobile Chamber of Commerce have authorized a careful and complete investigation of the question of "pirate parts." It is asserted that an increasingly large number of parts of this character are being placed on the market. Many complaints have been made that when they have been used in the maintenance of motor vehicles they have not given good service and have injured the reputation of the cars in which they were used.

Believing that a very large number of accidents are caused by over-speeding of motor cars and motor trucks, coupled with the over-loading of the latter, the N. A. C. C. is calling upon police officials of the country for a more strict enforcement of the traffic laws, of which there are a sufficient number on the books, but the provisions of which have been too generally disregarded.

Reports show that overloading of trucks of all sizes have in some cases harmed the roads and in other cases have overcome even the powerful brake equipment, resulting in accidents that could have been avoided.

The N. A. C. C. believes that a two-ton truck carrying four tons is more dangerous than a five-ton truck with its normal load of five tons. It endorses the Pennsylvania law, which requires each truck to bear a lettering showing its weight, the body weight and the weight of the load which it should carry. The chamber opposes truck bodies of abnormal size and advocates loads which will conform with the recommendations of automobile and highway engineers for one inch width of tire for each 800 lbs. of weight.

### ENGINEERS TO TRIM LAMP LAW

Indianapolis, Sept. 18—Organization of a committee of automotive engineers, which will draw up specifications to be approved and published as the legal limits for headlights, has been completed by L. M. Shaw, secretary of the Indiana Automotive Trade Assn., who was assigned the task by the secretary of state. The last Indiana legislature passed a law empowering and authorizing the secretary of state to establish specifications governing headlights.

The committee as now made up includes engineers from the Cole Motor Co., Lafayette Motor Co., National Vehicle Co., Nordyke & Marmon Co., Ford Motor Co. (Indianapolis branch), one to represent the automobile and the accessories dealers, one to represent the Indiana Auto Trade Assn. The secretary of state has had prepared a tentative specification, but is willing to discard it in its entirety if necessary, in order to arrive at a satisfactory result.



# Legal Problems

Conducted by Wellington Gustin

## Illinois Garagekeepers' Lien Law Explained

THE following letter was received by MOTOR AGE in answer to a criticism of the Illinois Garagekeepers' Lien Law. MOTOR AGE called attention to scant protection afforded the garagekeeper as against the holder of a chattel mortgage. This communication explains the circumstances altering the proposed law before it was acceptable to the legislators:

"We have had called to our attention an article on page 47 of the issue of June 2, 1921, MOTOR AGE, entitled, 'The Proposed Illinois Garagekeepers' Lien Law.' In that article section four of the law, as recently enacted by the Illinois legislature, is criticised on the ground that the garagekeeper is not given sufficient protection as against the holder of a chattel mortgage.

"This law was drawn in our office. As originally drawn, if you will get a copy of Senate bill No. 42 you will find that the garagekeeper was protected in every way, even as against a chattel mortgage. There are, however, millions of dollars outstanding in Illinois in chattel mortgages on automobiles, and the various automobile dealers through the state raised such a protest that they would be put out of business that there was no question but that the legislature would not have enacted Senate bill No. 42 into law if section four as originally written had been retained. In view of that fact, the only thing that could be done was to effect a compromise. The compromised bill was enacted into law without opposition, and it represents the best that could be obtained from the legislature at this time.

"By careful reading of section four you will find that any lien now existing at common law is not excluded but still remains.

"This means that here in Illinois, where repairs are made upon an automobile, the garagekeeper would have a right of lien superior even to that of a chattel mortgage so long as he retained possession. The lien created by the act is in addition to the common law right of lien, and does not exclude the common law right. Even this was objected to at first by the automobile sales agencies, but they finally consented to the section standing in its present form.

"We respectfully suggest that in view of your article you print this explanation in order that garage owners may know that in framing the law their rights were in every way fully protected up to the point where it might have meant placing in jeopardy other branches of the automobile industry."—Goodnow, Matthews, Lucius & Buchler, Attorneys at Law, Chicago.

## May Hold But May Not Retake Car

Q—We put a tire on a car to be paid for weekly; as it is only half paid for now, can we go and get this tire for the balance, which is more than it is worth now?

A—Can we take a car after it has left our shop for a bill covering repairs and the cost of a tire?—Pollock Bros., Odes, Ia.

Unless you have an agreement reserving title to the tire until fully paid for, you may not take the tire from your customer, except upon getting judgment and levying an execution.

Unless there has been a recent enactment of the Iowa legislature giving a lien to garagekeepers, as you suggest, there is no such law in Iowa. The garageman in Iowa may retain possession of a repaired car until his

## Legal Service

SEEMINGLY knotty legal problems are constantly arising in the dealer's business, which even a slight knowledge of the law easily may solve. MOTOR AGE presents here the most common legal problems which confront the dealer. Mr. Gustin, a member of the Chicago bar, not only is well versed in the law relating to the dealer, but presents it in such a way as to be readily understood by the layman. In addition to his articles, Mr. Gustin will gladly answer such individual inquiries on knotty points as may be submitted to him.

charges are paid, but once he extends credit to his customer and allows a car to be taken from his possession he may not retake the car under a claim of lien.

## Liability for Accidents to Salesmen-Owned Cars

Q—Will you give me your opinion in reference to the following questions?

The salesmen in our employ own their own cars, and sell on a commission and expense basis. Could we, in addition to the car owner, be held liable in case of a collision, because the salesman was operating his car earning a commission from his efforts in selling our goods?—S. J. Hunt, St. Louis, Mo.

I have failed to find any court decision on your proposition, but the general rules appear against liability on your part for the negligent operation of cars owned and driven by your commission salesmen. However, there is a consideration which might determine the question. If your contract with your salesmen require them to use cars in transacting your business and, while performing their duties to you and transacting your business, they cause injury by the negligent operation of their cars, it is probable that you could be held liable with them. But where they are simply employed to sell, leaving the details concerning the means of transportation to the salesmen, I am of the opinion you would not be so held liable.

Most all the cases decided are predicated upon the fact of ownership of the car by the employer. Even then, the injury must result while the negligent operator of the car is in and about his employer's business, or within the scope of his employment.

I do not think the question concerning the way the employee was paid, as by salary or commission, makes any particular difference as regards responsibility.

## Garageman Responsible for Damage

Q—A short time ago I left my car at a garage with instructions to furnish some new push rod bushings and valve lifters and, after having completed the job, the mechanic started the motor, ran the car several blocks, and burned out the front camshaft bearing, causing the camshaft and the crankshaft to become damaged. The result was the installation of a new camshaft and crankshaft.

Is the mechanic responsible for the damage and should he have to bear the expense of replacing these damaged parts, as well as supply his labor? He finally advised me that he had done all that he could do for me and told me to get my car. I did so; however, the car is not in perfect mechanical condition, though it was when I drove it into his garage. He has not yet offered to bear the expense of the parts necessary to put the car into good running order.—W. M. Pate, Hoberg, Mo.

If you can show that these damages were the result of the work of the mechanic, or that his negligent operation of the car caused the camshaft to burn out, with the resulting damage, then you should recover for the loss. As a matter of fact, the burden is on the garage or mechanic to show that the damage was not caused by any negligence or imperfect work on his part. If he cannot show this, he should bear all the damage done to your car, replacing of parts included.

The question then is one of fact. The law makes the garage or repairman responsible for his negligence and imperfect work.

## Recovering Damages for Accident

Q—In a garage recently B drove his car against the car under which I was working, forcing it over my left leg, breaking it. B claims he had come to take his car out of the garage and that there was not sufficient room in which to turn to prevent the collision, and further that he did not know I was under the car he struck. Can I recover damages for my injuries from B?

If you were not negligent in the matter, and if you can show that B did not exercise reasonable care to avoid striking the car under which you were working, then you should recover for B's negligence. That B did not know you were under the machine might relieve him of the charge of wilful negligence and thus decrease the damages, but would not relieve him of the actual damages you suffered.

# The Readers' Clearing House

## Questions & Answers

CONDUCTED BY WM. H. HUNT

### Triple and Single Heat Spring Tempering

**Q**—Publish the internal wiring diagram of the Cadillac 1918 and 1919, if possible.

**2**—How are springs retempered?

**3**—As we understand it, the magnetic lines of force travel in one direction only, namely, from south to north through the core of the magnet and from north to south through space. How can this be positively proven? By what experiment?

—Joseph Henwiler, San Francisco, Calif.

**1**—See Fig. 1.

**2**—The tempering of springs is a very expert job. The following explanation shows the way one of the big spring manufacturers does the job. The carbon content of the steel is the principal factor determining the temper. In pure carbon steel there is a certain percentage of carbon which gives excellent results when properly treated. The concern in question claims to get the finest possible grain with a carbon content of 0.9 per cent by heating to 690 deg. cent. and cooling quickly. If more or less carbon is used, the grain will not be so fine, because the metal has to be heated above 690 deg. cent. Three heats are used.

Assuming that the steel is pure and has a carbon content of 0.9 per cent and is 99.01 per cent iron, it is first heated to 760 degs. cent. It is then quickly quenched to a black heat. If the quenching were carried to ordinary room temperature, the steel would be too brittle to handle. By the above treatment the original structure of the steel is entirely changed and it becomes soft enough to work. It is at this stage that rearching or setting is done.

After the steel has been given its proper form it is again heated up to 690 deg. cent., which eliminates the hard spots caused by unequal cooling while it was being worked. After this heat it is cooled less rapidly than in the first case in order that it shall change to the form where it is resilient and tough; but even so, it is still too hard and brittle for use in a properly made spring.

Finally, it is again heated to about 300 deg. cent. and left to cool gradually. The result is to relieve the cooling strain and allow the steel to assume its final form where it is sufficiently tough, resilient and hard without being brittle.

Another method is by the single heat treatment. In this one the heat is carried up to 690 degs. cent., quenched for a very short time and allowed to cool slowly. Of course, many hard spots will be present in the finished part, but the one heat method is a quick way which seems to give fairly satisfactory results.

We must warn you that there is no

hard and fast rules for retempering springs, for the reason that the material used varies enormously. The treatment given above is for a steel with a carbon content of 0.9 per cent. Other compositions of metal require other treatment. Any good blacksmith will tell you that retempering of springs is an art which can be acquired only through long practice.

**3**—The flowing of the lines of magnetic force is a figure of speech that has been adopted to express something that is not perfectly understood. It cannot be demonstrated that lines of force flow any more than it can be demonstrated that gravity flows. We can demonstrate magnetism and gravity as forces that are ever present in every-

thing but that they actually flow from one point to another is beyond proof. Tracing the outline of the lines of force surrounding a magnet can be done with a simple compass as shown in Fig. 2. Here it is seen that the north pole of the compass always points toward the south pole of the magnet and the south pole of the compass toward the north pole of the magnet. There seems to be a movement of the lines of force thrown out by an electro-magnet. However, after these have reached their full intensity there is no further movement until they begin to weaken. However, even in this case it cannot be said that the magnetism flows. It is more correct to say that it grows outward from the magnet core in lines parallel with it.

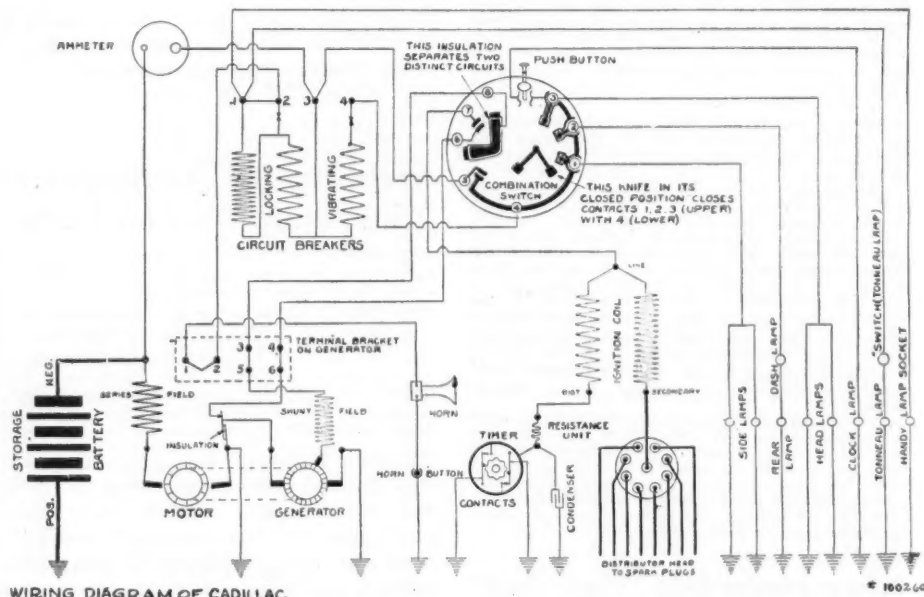


Fig. 1—Internal and external circuits of Delco-Cadillac, 1918 and 1919 system

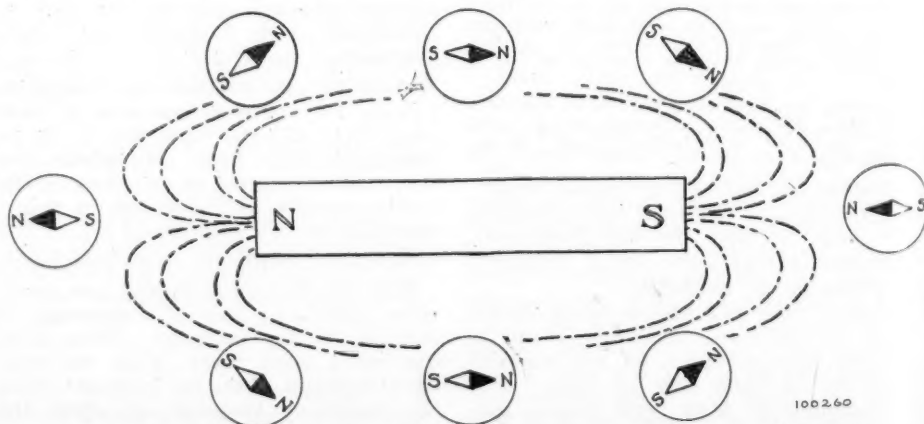


Fig. 2—Paths of the lines of magnetic force surrounding a bar magnet



## INSUFFICIENT DATA ON STEARNS KNIGHT CAR

Q—We have a number of Stearns-Knight cars here that have trouble in keeping their batteries charged up, regardless of the make of battery. They use a 12-volt battery. Does the generator charge the battery as a 12 or 6-volt system and what amperage output should the generator have. Publish wiring diagram of the 1919 and 1920 Stearns; also switch diagram. What would you suggest as the possible trouble on these particular cars. We have been checking up on generators and find the charging rate ranging from 6 to 14 amps. On some of them it is particularly hard to raise the amperage.—Auto Service Co., Hawarden, Ia.

Your data is insufficient to permit us to formulate a satisfactory reply. The 1919 Stearns Knight used the Remy generator No. 238A and Remy starting motor No. 309A, while the 1920 car used the Westinghouse apparatus generator frame No. 755 and starting motor frame No. 765. The instructions covering the two systems vary considerably. If you will be more explicit in your inquiry we will be very glad to go into the trouble at length.

The normal current output of the Remy generator is 7 volts at 550 r.p.m., 14 amp. at 670 r.p.m., and 18 amp. at 765 r.p.m. The voltage varies between 14 for the low speed and 15 7/10 for the higher. The normal output for the Westinghouse generator is 5 amp. at 560 r.p.m., 7 amp. at 2000 r.p.m. and 9 to 10 amp. at 750 to 950 r.p.m. The foregoing figures apply to the low resistance field winding. With the high resistance field winding the figures are as follows: 6 amp. at 660 r.p.m., 5 to 9 amp. at 2000 r.p.m. and 10 1/2 to 11 amp. at 1000 to 1400 r.p.m.

However, the trouble may not be in the generators or generating circuit at all. It is possible that the starting motors are drawing too much current either on account of being partially short circuited or because the engines are dragging heavily from insufficient lubrication or too heavy oil or other cause.

## REBUILT GENERATOR WILL NOT OPERATE

Q—Publish the wiring diagram of the inside of the Gray & Davis generator with the black square box regulator on top. This generator has been rewound but it will not operate. Neither ourselves or any other shop in town can do

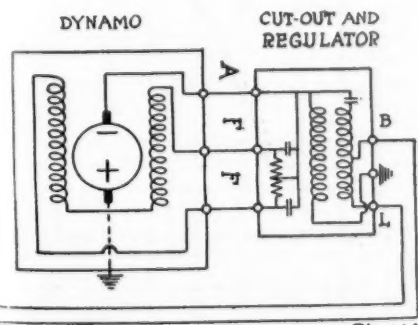


Fig. 3—Internal arrangement of a Gray & Davis generator and regulator-cutout

## The Readers' Clearing House

**THIS** department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by someone else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

Emergency inquiries will be replied to by letter or telegram.

anything with it.—W. A. Carter, Charleston, W. Va.

See Fig. 3. If the armature and field windings are normal, the trouble will be found in the square box regulator or in the ground connection which is made by attaching a wire from the positive brush to a screw in one side of the generator casing. To test, disconnect the battery wire from the point "B" and connect it directly to the terminal marked "A" through an ammeter. With the engine up to a fair rate of speed, connect a piece of barbed wire from binding post "A" to binding posts "F" and "E." The foregoing connections have the effect of cutting the regulator out entirely.

With the bare wire applied, as above instructed, the engine speed must be held quite low, as the regulation is entirely cut out and, if the engine is speeded up, the current will rise to an abnormal value which may result in a damaged field or armature winding. If no current is obtained by the above test, connect a wire directly from the positive brush to the metal of the generator frame or casing direct. This will determine whether or not the ground connection is at fault. If no current can be obtained by any of the above tests the fault is certainly inside the generator and may be a short or open-circuited field or a short, open-circuited or grounded armature. The tests for the foregoing have been published several times before.

## THE MAJORITY IS AGAINST YOU

Q—Recently we noticed a suggestion from one of the readers of Motor Age to the effect that by installing a socket on a Tungar rectifier so that the bulb would be upside-down, the life of the bulb could be greatly lengthened because of the tendency of the filament to bow away from the carbon electrode. This manner of reversing the bulb was expected to cause the filament to bow back toward the electrode and in this way keep the arc distance about the same.

We have been using three 30 cell Tungars for a period of three or four years and we have tried that idea and found that it is the repellant effect of the arc that causes the filament to bow away and that reversing the bulb does absolutely no good. We trust you will

bring this to the attention of Motor Age readers.—Altona Battery Co., Galena, Ill.

If it were not for difference of opinion this would be a monotonous world in which to live. Many Tungar users have found the reversible tube mounting to be worth while and have even gone to the expense of rigging up well-made exterior panels and mounting the bulbs upon them. We have seen these outfits in service and have the assurance of the users that they prolong the lives of the bulb. Another strange thing is that it has been found that the Tungar bulbs will give very good service when connected directly with a 110-volt line instead of through the voltage reducing transformer.

## GROUNDING DELCO THIRD BRUSH IS WRONG METHOD

Q—Advise why the Delco generator on a D 45 Buick will not charge except when the third brush is grounded. We have shortened the third brush bracket so that the brush is very close to the positive brush, but still the machine will not generate.—The Coloma Garage, Coloma, Wis.

You have moved the third brush in the wrong direction. It should be moved to the right when you are looking at the commutator end of the machine. This is illustrated in Figure 4. By a study of the drawing it at once becomes apparent that grounding the third brush is, in effect, the same as though the wire was disconnected from it and connected directly to the main negative brush. This would, of course, send most of the armature current through the shunt winding. The effect would be to cut out regulation entirely and cause the generator to deliver an abnormal output.

Instructions: move the third brush closer to the negative or grounded brush; after it is set, sand it in carefully with No. 00 sand paper—not emery cloth—wrap the sand paper around the commutator with the sand side out next to the brush. A few turns or rubs back and forth should seat the brush by dressing it down to the contour of the commutator. Unless this is done, the brush will bear only on a sharp edge which will introduce so much resistance that insufficient current will pass to energize the shunt field.

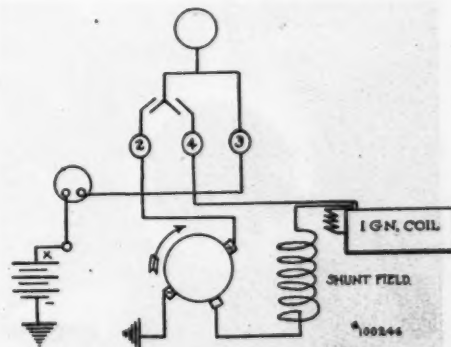


Fig. 4—Generating and regulating circuits of Delco generator number 70 used on Buick models D44, 45 and 46. Moving the third brush clockwise to the commutator increases the current output

## ENGINES

### REMOVING FORD WRIST PIN BUSHINGS

Q—What is the best method of removing bushings from Ford pistons and putting in new ones? Mention several ways.

2—Is it usually necessary to rub down the new bushings before pressing them in?

3—How is the fan belt adjusted on the Overland Four?—Geo. A. Werner, High Ridge, Mo.

1—The best method of removing the bushings is with the use of an arbor press and the special fitting shown in Fig. 5. Care should be exercised that the piston is not distorted. Driving the bushings out with a hammer invariably results in knocking the piston out of round. The driver should be slightly smaller in diameter than the hole through the pistons and should be finished with a short stub slightly smaller than the hole in the bushing. This serves to line it up with the bushing and prevents side binding. One bushing is removed through the inside of the piston which is then turned over and the other forced out in the same manner.

When pressing in the new bushings, it is important to have them line up properly with the piston holes, as a cocked-over bushing requires considerably more pressure to force in and may cause the piston to be pressed out of round. The bushing should be pressed in until it is about  $\frac{1}{8}$  in. exposed on the inside of the piston or until it is  $\frac{1}{2}$  in. inside the outside diameter of the piston. When the bushings are in place they should be reamed to size with a standard Ford pilot type reamer, which had best be purchased from the Ford Motor Co. or a Ford dealer.

There are no several ways of doing the job right. As mentioned before, the hammer must not be resorted to at all unless the mechanic is willing to run the chances of springing the piston.

Another method which works fairly well is to provide a heavy washer somewhat smaller than the piston hole, a  $\frac{1}{4}$ -in. bolt  $4\frac{1}{2}$  in. long, threaded for about 2 in. of its length, a nut for the foregoing and a piece of heavy flat stock

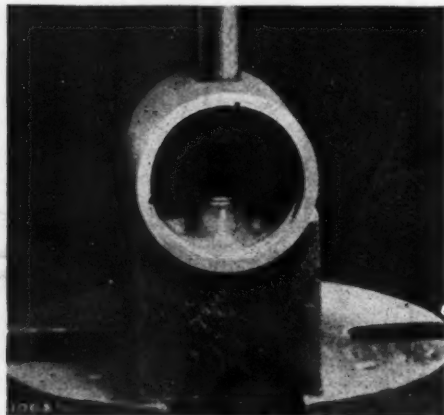


Fig. 5—Special fitting used to remove Ford wrist pin bushings without damaging pistons

drilled with a  $\frac{3}{8}$ -in. hole. To use, the washer is placed over one of the bushings, the bolt passed through it, the two bushings and the hole in the piece of flat stock, and the nut applied to the bolt and drawn down. This will, of course, pull the bushing to the inside of the cylinder. The process is then repeated with the other. The pistons may be held by the ends in a vise protected by two pieces of soft wood. As little pressure as possible should be used.

2—It should not be necessary to dress the bushings down on the outside. If they are started into the holes straight they will press in without great difficulty, although .001 or .002 in. may be shaved from them in the process. After they are pressed home they should be reamed as mentioned in the preceding paragraph.

3—See Fig. 6. Loosen the clamping screw and tap the whole bracket upward from the bottom. The heavy compression springs will take up the distance as the bracket is moved upward. Do not forget to tighten the clamping bolt.

### OVERHAULED ENGINE OVERHEATS

Q—We would like to know what makes an Oldsmobile engine which we have recently overhauled, heat so badly that it boils the water in five minutes. After turning off the switch it continues to run for a minute or two. The pump works

like new, the water circulation and fan are in the best of condition, and we have replaced all the ignition parts with new ones.—Jasper Machine Works & Garage, Jasper, Ind.

Were you not so positive in your statement that the engine has been properly overhauled we should attribute the trouble to a combination of late timing and a heavy carbon deposit. However, we think it unlikely that you have made errors on these points. If calcium chloride antifreeze solution has been used at any time it is possible that a coating of rust or scale in the water jackets is responsible. It can be removed with a strong lye water solution.

It will also be well to examine the hose connections closely. If these were not replaced, it is very possible that one of them has become oil-soaked inside and swelled so badly that it is restricting the water flow. This condition is many times present and unsuspected for the reason that the hose shows no swelling on the outside.

If new connections have been installed it will not be surprising if one of them is found doubled until the water passage is only a quarter of what it should be. This is a common occurrence and one which often causes serious damage to cylinders and pistons before it is discovered. We strongly urge that the engine be not run to the overheating point until the fault is remedied or, if it is necessary to run it, that it be kept flooded with oil.

### CAN ENGINE STROKE BE INCREASED

Q—Publish the power curves of the McFarlan Six 1921, the Kissel 45 6-cylinder and the Stutz 16-valve 4-cylinder.

2—Can the stroke of the Hudson super six be increased from five to six inches by installing a new crankshaft?—A. J. H.

1—See Fig. 7. The power curves of the McFarlan and the Kissel 45 are not available.

2—While it might be possible to increase the stroke by installing another crankshaft, we strongly advise that it be not attempted, for the reason that it would entail other profound changes such as raising the cylinders, installing new camshafts, etc., which would bring the cost to a figure all out of proportion to the value of the car.

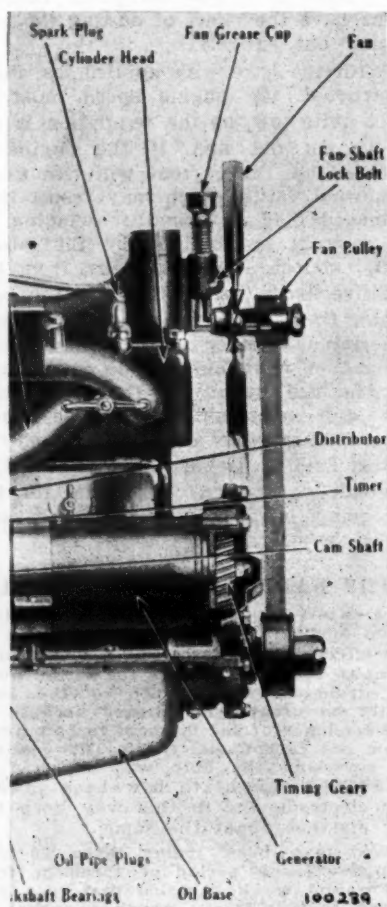


Fig. 6—Fan belt adjustment of Overland light Four

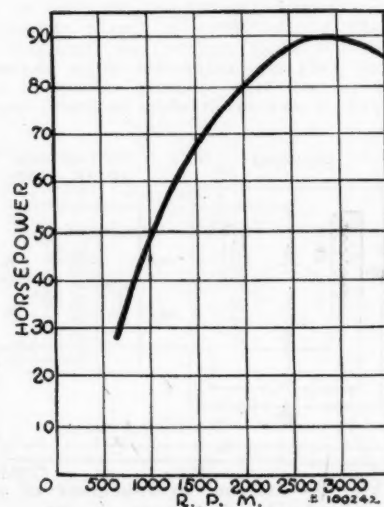


Fig. 7—Power curve of Stutz 16 valve engine



### ENGINE OVER-OILS BADLY

Q—We have been working on an Oakland car; after having replaced new pistons and rings, fitting them as close as possible, we find the car has excellent speed and plenty of power, but gives evidence of over-oiling. The new pistons stopped the trouble for a few hundred miles, but it is now as bad as ever. The oil pressure has been reduced to the limit but this does no good and neither does the use of extra heavy oil.—E. Allen, Burlington, N. J.

Referring to Fig. 8 it will be seen that the Oakland oiling system is of the pressure feed type. It is not unusual in this type of system for the supply of oil thrown to the pistons to increase as the main bearings and connecting rod bearings wear. The reason for this is that as the distance in the bearings increases, it affords an easy resistance path for the flow of the oil, which is evidenced by the drop in pressure on the oil gage. We would recommend that all of the bearings be taken up snug and that in doing so you pay especial attention to the amount of end-play.

### KNIGHT ENGINE BREAKS SLEEVE

Q—What causes the frequent breakage of the lower edges of the sleeves in a Willys-Knight engine? They last only about 5500 miles and then have to be replaced. Other parts are in good condition. Car has been driven 20,000 miles and sleeves have been replaced several times.

2—An Oldsmobile 6 has been driven 28,000 miles and has worn out one set of aluminum pistons and is about due for another set, as the compression is weakening. Have always used good oil and drained it regularly. How long should the pistons wear? Is 14,000 miles good? Will the block outlast several sets before re-boring is necessary?—H. Temple Deamon, Marble Cliff, O.

1—This is an unusual condition and almost merits mention in the "Mystery Tales" column. If all parts are kept tight so that no undue vibrations are set up, we can attribute the trouble to nothing other than faulty lubrication. It is very plain to see that if the sleeves become even slightly dry they will have a tendency to stick, bind, and drag badly. Graphite applied to the sleeves before they are assembled will give them a highly glazed finish, which may help to overcome the trouble. It is not recommended that the graphite be added to the lubricating oil, as it is almost invariably the case that too much is used.

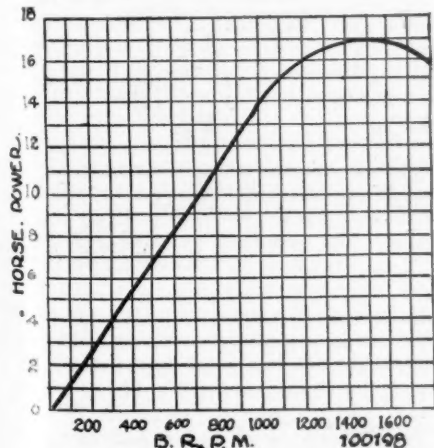


Fig. 9—Test card of Ford engine, showing power curve

SCREW IN IS FOUND ON ENGINE OPPOSITE CARBURETOR.  
ON PRESSURE GAUGE ON INSTRUMENT BOARD.  
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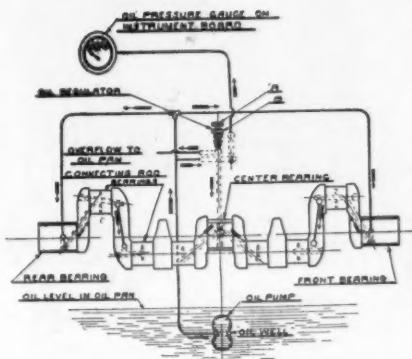


Fig. 8—Pressure type oiling system used in Oakland engine

This usually results in the plugging up of small oil holes.

2—A fair average for aluminum pistons is 20,000 rather than 14,000 miles. However, local conditions or methods of driving may reduce the figure to the latter. The usual practice, when installing new pistons, is to lap out the cylinders until they are the same size from top to bottom. This usually requires the removal of from .002 to .003 in. at each end of the ring travel. It is well when doing this to measure the cylinders with a micrometer to be certain that they are round. The lapping should be done with an old piston or with an oilstone especially designed for the job. When the wear is more than .002 or .003 in., grinding is recommended. The small amount mentioned can be lapped out successfully.

### FORD ENGINE SHOULD MAKE GOOD POWER PLANT

Q—In your opinion will a Ford engine, if used as an industrial motor to develop 10 hp., overheat if it is used in periods of two hours each?

2—Publish a power curve for the Ford engine.—Frank Leahy, Minneapolis, Minn.

1—No. We believe the Ford engine, if used as outlined, will give perfectly satisfactory results.

2—See Fig. 9.

### POWER CURVE OF DODGE BROTHERS ENGINE

Q—Publish the power curve showing revolutions per minute and brake horsepower of 1917 Dodge Brothers engine.

2—What is the S. A. E. rating of this engine?—Bay City Garage, Bay City, Wis.

1—See Fig. 10.

2—The S. A. E. rating of this engine is 24 h.p.

### THE WHY OF THE LARGE INTAKE VALVE

Q—Why is the intake valve larger than the exhaust on the 1920 model Buick car? Some claim that it gives the engine more power.

2—Is there any book published on the repair of the Buick six?—The Texaco Garage, Oil City, Pa.

1—The heavier grades of fuel which are now procurable require a great deal of heat for their perfect vaporization. The resulting expansion of the incom-

ing charge makes it difficult to get enough of it into the cylinder to give the full power that is to be expected from a certain bore and stroke. This has to do with the problem of volumetric efficiency. It being difficult to draw in the proper charge, the logical thing to do is to increase the sizes of the passage and valves as much as possible. This the Buick engineers have done by increasing the size of the intake valve.

On the other hand, the exhaust gases are of no greater volume than they have ever been, so that it has not been necessary to increase the size of the exhaust valve. Two other explanations are that heated gas moves more freely than does cold gas, just the same as heated oil moves more freely than does cold oil and that, whereas, the exhaust gases have a great inertia plus the mechanical force of the pistons behind them forcing them out, the intake gases have nothing forcing them in except atmospheric pressure, which is about 14.7 pounds per square inch at the level. The difference in valve ratio will be an interesting engineering development to watch.

2—Not that we know of.

### VALVE TIMING OF TWO OLDSMOBILE 37-A ENGINES

Q—What is the correct valve timing on an Oldsmobile 6-cylinder 37-A?

2—What effect would it have on running if cam gears were set a tooth off either way?—Art Mellan, Galesburg, Ill.

1—The Oldsmobile 37-A was manufactured in both 1919 and 1920. The valve timing differs on each. The timing of the 1919 engine is as follows: intake valve opens 17.30 deg. late and closes 38 deg. late. Exhaust valve opens 42.30 deg. early and closes 7.30 deg. late. The timing for the 1920 model is as follows: intake valve opens 17.5 deg. late and closes 38 deg. late. Exhaust valve opens 42.5 deg. early and closes 7.5 deg. late.

2—Naturally, setting the camshaft gears incorrectly to the extent of one tooth either way would make the engine early or late to just this extent. If set early it would probably run well at high speed but would not throttle nicely. On the whole, it is not worth while to sacrifice the flexibility to the slight increase in speed. If set late, the effect would be a sluggish engine which would have a tendency to heat.

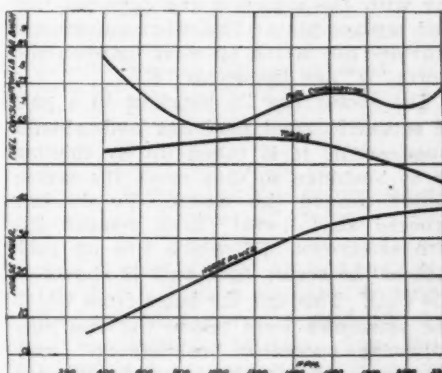


Fig. 10—Power, torque and fuel consumption curves of Dodge Brothers engine

## CARBURETERS

### CADILLAC CARBURETER AND STEERING GEAR ADJUSTMENTS

Q—Publish power curve of a Hupmobile 1918 Model R and of a 1913 Cadillac 4 touring.

2—Publish wiring diagram for a 1913 Cadillac 4 touring.

3—What is its bore and stroke and gear ratio?

4—How do you adjust the steering gear and carbureter?

5—We intend to make a service car out of this machine, cutting the body off in back of the front seat and using the latter. We should like to have a crane mounted on it. Could you give us the name and address of a concern making such apparatus and also a few suggestions as to what tools and equipment to carry?—Carl Hofberg, Aldan, Del. Co., Pa.

1—The power curves of these engines are not available. The cylinder dimensions of the Cadillac are  $4\frac{1}{2}$  in. bore by  $4\frac{3}{4}$  in. stroke, and of the Hupmobile  $3\frac{3}{4}$  in. bore by  $5\frac{1}{2}$  in. stroke.

2—See Fig. 11.

3—The gear ratio is 3 to 1.

4—Refer to Fig. 12. Two adjustments are provided. The first is to take up

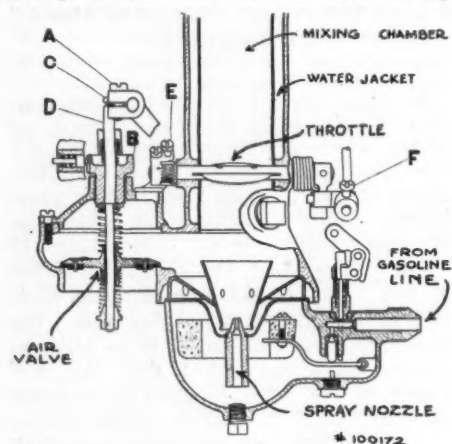


Fig. 13—Sectional drawing showing points of adjustment of 1913 Cadillac carbureter

end play in the steering shaft. When this occurs, loosen the jam nut and the set screw "B" and remove the plug "C," then with a screwdriver turn up the adjusting collar, which can be seen through the hole from which the plug "C" was removed. Then lock the collar with the setscrew and jam nut "B" and replace plug. The other adjustment provides for taking up wear between the worm "D" and the sector "E."

The sector has its bearings in a pair of eccentric steel bushings and, should wear occur, it is taken up by turning these bushings so they move the sector closer toward the worm. To do this proceed as follows: first, remove the two setscrews "F" which are on each side of the sector (one only is shown in the cut). Through the holes from which the setscrews were taken, the two nuts adjusting eccentric bushings "G" may be seen. Next, with a wrench, turn the hexagon head on the bearing bushing forward, moving the sector toward the worm, just one notch. Of course, they

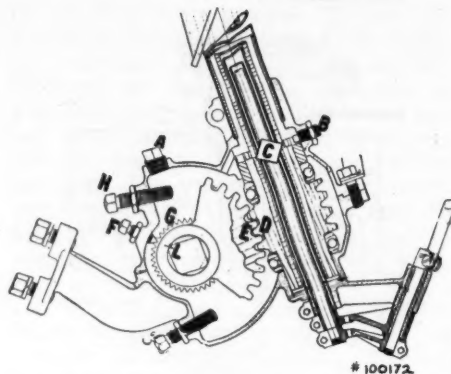


Fig. 12—Sectional view of 1913 Cadillac steering gear

may be turned more, but one notch will usually be sufficient. In any event be very sure to turn both sides exactly the same amount, otherwise the gear will be thrown out of alignment and will bind badly. Then replace the setscrews. Stop screws "H" and "J" limit the range of movement of the steering gear and front wheel.

Carbureter adjustment: refer to Fig. 13. Loosen the lock screw "A" and raise the finger "C" so that there is considerable clearance between the finger "C" and the air valve stem. Adjust the air valve so that the knurled screw "B" is about  $\frac{1}{8}$  of an inch from being in its lowest position. Open throttle lever about 2 in. on sector (on steering wheel), place the spark lever on center (stamped "C" on sector), and start engine on the battery system. Run engine until the water jacket of carbureter is hot. Move the throttle lever to a position which leaves the throttle in the carbureter slightly open.

Place the spark lever on center, and adjust the air valve screw "B" to a point which produces the highest engine

speed. Retard the spark lever to the limit, close the throttle and adjust the throttle stop to a point which allows the engine to run at a speed of 280 to 300 r.p.m. Adjust the air valve screw "B" to a point which produces the highest engine speed. It is best to slightly favor the rich mixture side in making this adjustment. Adjust the collar "F" on the throttle rod so that the throttle will start to open when the throttle lever at the steering wheel is open about  $\frac{1}{2}$  in. Place the air valve lever on the steering column as far forward as possible and adjust the finger "C" about  $\frac{1}{8}$  in. away from the air valve stem.

5—A very good crane may be procured from those advertising this equipment in MOTOR AGE. Several reliable firms make such cranes. It is recommended that spare ignition and tire parts be carried as well as an assortment of various weights of hammers, tires, screwdrivers, etc., and also a full set of end wrenches from  $\frac{1}{2}$  to 1 in. Large and small pipe wrenches, tire changing tools and a spare battery should also be part of the equipment.

### ADJUSTMENT OF FRANKLIN CARBURETER

Q—Tell us how to adjust the carbureter on the new Franklin Car.

2—Where can I get literature on this carbureter.—Worth Motor Co., Dallas, Tex.

1—Refer to Fig. 14. This carbureter of exclusive Franklin design and manufacture is especially adapted to the Franklin air-cooled engine. Gasoline feed is regulated by a copper float. The single spray nozzle has four branches; each drilled with a No. 64 drill. Both the needle valve and air intake are adjustable from the dash. The main air intake has two branches, one of which draws in air under atmospheric temperature, and the other, air that has been heated by passing over the exhaust yoke. A rotary disk valve, which moves over both air intakes and is operated by a lever on the cowl board called the carbureter air control, makes it possible to admit cold air,

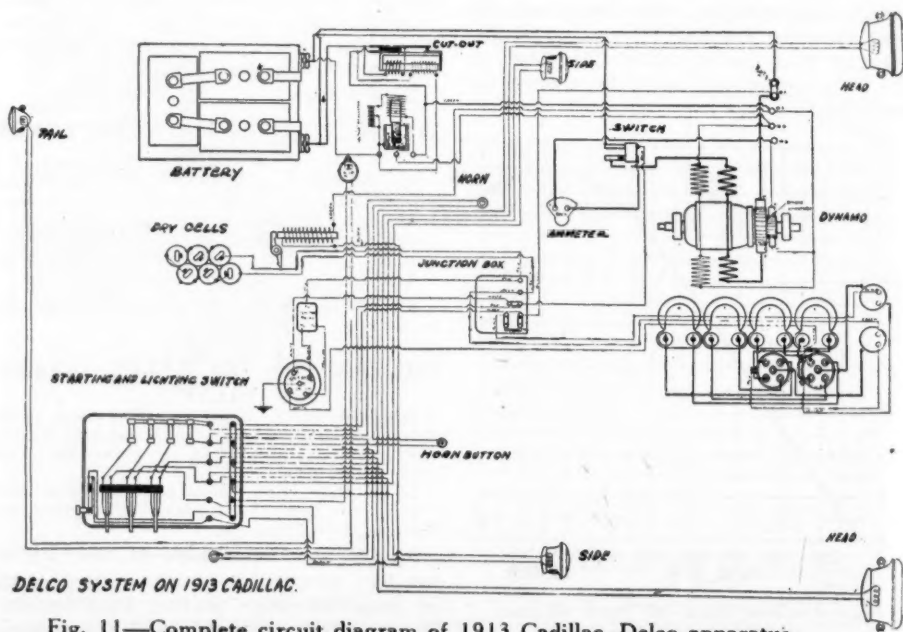


Fig. 11—Complete circuit diagram of 1913 Cadillac, Delco apparatus



hot air, or shut off air supply completely.

The operation of the electric heater or primer, which is a part of the carburetor, is as follows: when the carburetor air control lever on the cowl board is held firmly over on "Start," an electric circuit is made through a resistance coil which heats the gasoline in the heater. At the same time this operation opens a valve that allows free entrance of the heated gasoline into the carburetor above the throttle valve. When the heater is working properly blue smoke and a little gasoline leak out around the top while the carburetor air control lever is pressed firmly against the end of the slot on "Start."

If the heater shows no signs of drawing current, inspect the wiring connections and resistance coil in the heater. Trouble may also occur from the failure of the primer valve to set. The auxiliary air valve, of the butterfly type, is controlled by a single coil spring acting on a lever so located that the greater the tendency of the valve to open, the stronger is the retarding force exerted by the spring.

This action, therefore, offers little resistance to the admission of auxiliary air under slow speed running, but offers increasing resistance as the engine speed increases. This regulation keeps the quality of the mixture constant under all conditions.

Beneath the float chamber is a separating chamber, which contains a 120 mesh brass screen, through which the gasoline must pass before it reaches the float chamber. Clean the carburetor after every 2500 mi.

Normally, the distance from the bottom nut on the float valve stem to the beginning of the seat of the stem should be  $\frac{5}{8}$  in. With this setting, the valve of the gasoline is  $\frac{1}{32}$  in. below the spray nozzle openings. Screwing the adjusting nuts up, lowers the level; screwing them down, raises it.

Hard starting, "loading up," missing, and lack of power may indicate that the auxiliary air valve needs adjustment. First, be sure that the valve seats properly, and then change the tension of the spring acting on the valve stem lever by adjusting the screw to which the spring is attached. Adjust so that when the engine is stopped or throttled down very slow, the valve will seat, but only so lightly that it will open as soon as the motor is accelerated.

To clean the carburetor, drain the vacuum tank and the carburetor. Remove the cover to the float chamber and take out the float. Unscrew the plug in the bottom of the float chamber and clean the separator screen. Remove the small round head machine screw that is in the side of the carburetor body to the left of the auxiliary air valve lever, close the needle valve and force air through the screw hole. This will clean out the spray nozzle. Then open the needle valve several turns and again force air through the machine screw hole so as to clean out the passage to the float chamber.

If the needle valve works too easily,

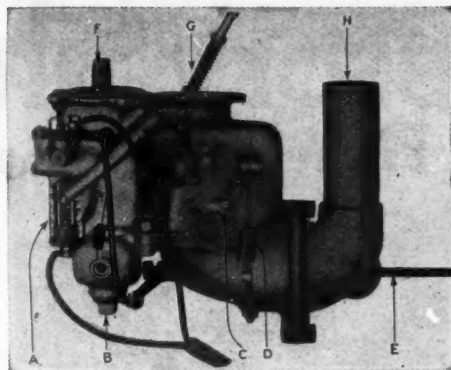


Fig. 14—Franklin carburetor with reference letters mentioned in the article on adjustment

tighten clamp screws on the front of the dash, or, by using washers, increase the tension of the coil spring where the needle valve shaft enters the carburetor. If the needle valve binds, oil its parts and loosen the clamp. Sometimes it is necessary to take the valve completely out of the carburetor and clean the threads before it will turn easily.

If the carburetor leaks when the engine is stopped, dirt probably is lodged under the float valve. If pressing down the priming button several times does not dislodge the dirt, unscrew the cap, screw in the top of the float chamber and then give the float valve stem several turns with a screwdriver. If this does not remedy the trouble, shut off the supply of gasoline and locate the exact cause of the trouble. It may be a leaky float, a poorly balanced float, poor seating of the float valve, a bent float valve, a too high level of gasoline, a leaky joint where the gasoline line is connected, or a cracked spray nozzle.

To reseal float valve, unscrew the cap screw in the top of the float chamber and grind in the float valve by twisting with the screwdriver. Grinding compound is not required. If it is found that a float is inclined to leak at times and on inspection it seems to show no leakage, it may be tested easily by immersing in a pail of very hot water. If the float is of cork, as it is in some carburetors, it should be thoroughly dried by drying it over the heat from an electric light globe. After it is thoroughly dried it should be shellaced.

2—We know of no source from which to secure literature short of the factory of the Franklin Automobile Co., Syracuse, N. Y.

#### COMBINATION 490-F. A. RACING CAR

In your issue of Aug. 4, one of your readers stated he had made a Chevrolet F. A.-490 racer, which is similar to one we have. The installation of a higher gear in the axle may solve his problem of increasing the car speed; we expect it to do so for ours.—Roanoke Motor Car Co., Inc., Roanoke, Va.

#### TRUCK FLEET MASTERS, ATTENTION

Q—Herewith is a routine we have followed in maintaining a  $2\frac{1}{2}$ -ton Mack truck. Will you please correct any mistakes we may be making?

Front wheel bearings, 8 oz. grease every 500 miles; universal joints, 8 oz. grease every 500 miles; propeller shaft bearing, 4 oz. grease every 500 miles; fan bearing oil once a week; brake rigging, 4 cups grease and oil once a week; steering gear, grease once a month and oil every week; drag link and ball joints, grease once a week; oil rear wheel bearings twice a week through  $\frac{1}{4}$  in. elbow and  $\frac{1}{4}$  in. nipple  $1\frac{1}{2}$  in. long; magneto, oiled once for every 200 gal. of gasoline; springs, painted with a mixture of oil and grease every 1,000 miles; engine, oiled with Mobiloil, 1 qt. for every 20 gal. of gasoline; engine, oil renewed every 1,000 miles.

We never carry more than 9 qt. of oil in the crankcase, although the capacity of the system is 2 gal.—R. G. Mitchell, 162 W. Ridge St., Lansford, Pa.

It would seem to us that this truck is receiving excellent care. You have overlooked mentioning the water pump lubrication, but we are certain that you are following the rule of turning the grease cups down frequently and renewing the lubricant as they empty.

You also neglect mentioning what care you may be bestowing on the spring shackle bolts. These parts are universally neglected. Although the mixture is doubtless lubricating the springs efficiently, we suggest that powdered or flake graphite be added to it. Further suggestions from truck fleet masters will be welcome.

#### ANOTHER QUESTION ON FRANKLIN CARBURETOR

Please explain the adjustment and show a view of the carburetor used on the Franklin Six. We have a Franklin which seems to be getting too much air, as it keeps popping back through the carburetor. We wonder whether there should not be a spring on the round air valve and if the valve should not be an easy fit on the stem. The carburetor operates best at  $\frac{1}{2}$  to  $\frac{3}{4}$  turn on the needle valve. The compression and ignition are all right.—Weiss Bros. Garage, Hamilton, O.

See Fig. 14 and detailed explanation of the adjustment of this carburetor published in reply to the query from the Worth Motor Co., Dallas, Tex.

#### COMBINATION BATTERY CASE AND JARS HAVE GREAT STRENGTH

It is claimed that the new type composition battery case and jars in one has exceptional power, having a tensile strength of 3600 pounds and an electrical break-down resistance of 18,000 volts.

#### AMBITIOUS READER REALIZES THE VALUE OF TRAINING

Q—Furnish me with the names of a few good and practical electrical training schools in Chicago where one could take from a two to a four year course in all kinds of electricity. After studying MOTOR AGE I have decided that there is a demand for automotive electricians.—John D. Dabney, Winterset, Ia.

Armour Institute of Technology, Lewis Institute of Technology, Coyne Trade School. The foregoing give complete courses in electricity as applied commercially. If you wish to specialize in automotive electricity we recommend the Ambu Engineering Institute. This concern makes a specialty of an intensive course in the subject which covers a period of a few weeks and is said to fit the student to do first class automotive electrical repairing.

# The Accessory Show Case

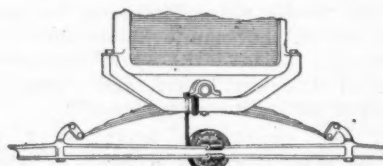
## New Fitments for the Car

### BEAR AUTOMATIC WHEEL ALIGNMENT INDICATOR

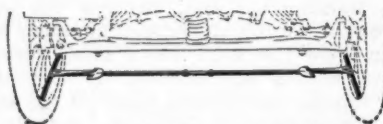
This device can be used to indicate pitch or toe-in. It telescopes when compressed and is held in position by the compression spring while the adjustment is being made. An indicator on the dial shows the degree of misalignment—each line on the dial representing one-quarter inch on the wheel. Price \$15. Bear Mfg. Co., Rock Island, Ill.



Shaler roadlighter lens



Gilman shock absorbers



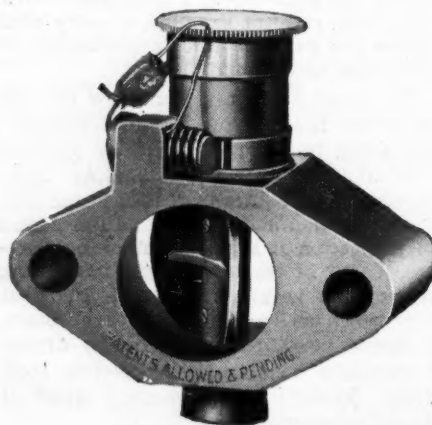
Bear automatic wheel alignment indicator

### OAKES SPARE TIRE LOCK

The Oakes tire lock is made for cars on which the spare tires are fastened at the bottom of the carrier by means of a rim wedge held on a threaded stud by an ordinary nut. It is made of two parts, a barrel-shaped casting and a lock. These locks are furnished in four types, among which is a special model for Fords. Price, \$5 for all models. The Oakes Co., Indianapolis.

### KURTZ GASOLINE ENGINE GOVERNOR

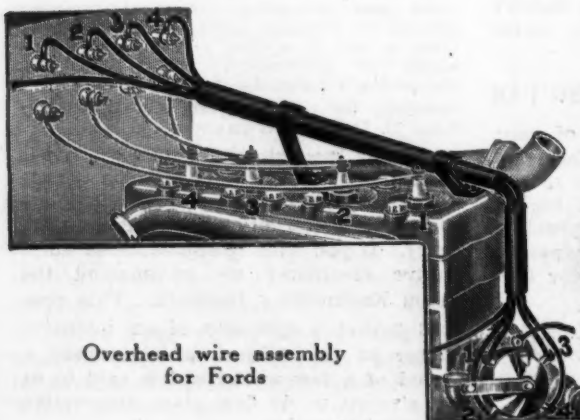
Designed to be placed between the carbureter and the intake manifold, the Kurtz governor works on the vacuum principle. It operates from the volume of fuel mixture passing through the manifold. The valve of this governor, it is claimed, oscillates thirty-three times per second at 1,000 r.p.m., churning the mixture and equalizing its flow. S. E. Kurtz & Son, Sac City, Ia.



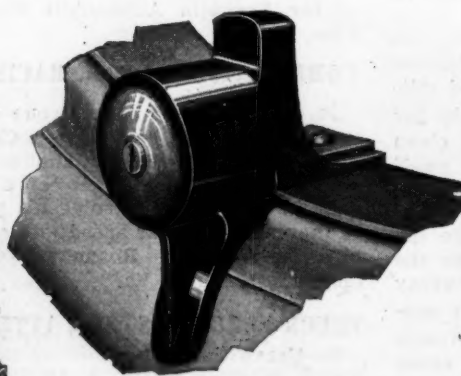
Kurtz governor

### OVERHEAD WIRE ASSEMBLY FOR FORDS

Fibre tubings, supported by two brackets, carry the ignition wires from the dash to the distributor over the top of the Ford engine. This protects the wiring from the possibility of becoming oil-soaked at the base of the engine. Complete assembly, \$2.50. Midway Mechanical Co., St. Paul, Minn.



Overhead wire assembly for Fords



Oakes spare tire lock

### MANZEL MECHANICAL CHASSIS LUBRICATING SYSTEM

This new system of lubricating chassis bearings involves pulling a button on the dash. It consists of a tank attached to the dash under the hood in which are arranged a number of pumping units with a tube or pipe leading from each. These main pipes are divided at proper places to provide a separate line for each point to be lubricated. It can be supplied for practically any make of car.—Manzel Bros. Co., Babcock and Imson sts., Buffalo, N. Y.

### GILMAN SHOCK ABSORBERS FOR FORDS

A pair of the regular model C Gilman shock absorbers constitutes a Ford set. One shock absorber attaches to the inside of the front axle directly below the crank, the cable end being held by a shackle fitting to the frame. At the rear, the shock absorber is attached to the spring shackles with the cable end hitched to the differential housing. Price per set, Ford Model, \$18.50. Gilman-Davis Co., 224 So. Michigan avenue, Chicago.

### SHALER ROADLIGHTER LENS

In the upper half of the Shaler Roadlighter there are two groups of diagonal prisms and in the lower half there is one group of vertical prisms. Each of these three groups handles its portion of the light independently, and directs it to the part of the road it is intended to light. The light from the bottom half of the reflector is divided into two parts by the groups of diagonal prisms which throw it downwards and toward the sides of the road. C. A. Shaler Co., Waupun, Wis.



Manzel mechanical chassis lubricating device



# Service Equipment

## Time Savers for the Shop

### PROCUNIER BUMPER LOCK

This is a combined bumper and lock. To operate, grasp the handle, release the thumb catch, snap the bumper down and the car is locked. The steel locking arms hold the front wheels in the position they are locked. Equipped with Yale tumbler type lock. Fittings supplied for attachment to any car. Price, \$30, \$31 and \$32. F. R. Procunier & Co., 1910 N. Campbell ave., Chicago.

### CHART TO ASCERTAIN CORRECT CHARGING RATE UNDER DIFFERENT CONDITIONS

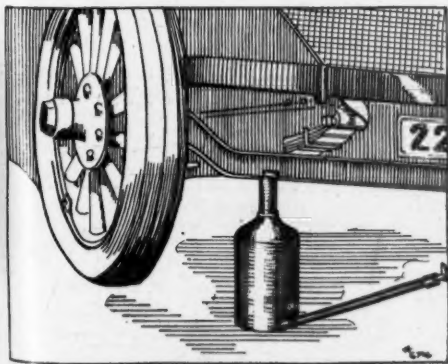
One of the problems that the garage or repairshop has to solve is the proper charging rates of batteries on the different makes of cars under different conditions of driving and weather. Setting the charging rate is guesswork. Where one shop would set the rate at 8 amp. the next would possibly set it at 17 amp. There is being placed on the market a chart that any mechanic can operate, which will show what the charging rate should be for the four seasons of the year. The price of this chart is \$2. The Auto Electric Engineering Co., 7335 Vincennes ave., Chicago.

### DUBY WHEEL GAGE

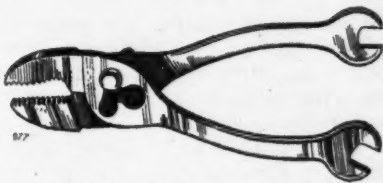
The alignment of the wheels is tested by placing the device between them and extending the sides to touch by means of the "X" shaped handle. The degree of misalignment is indicated by a pointer moving across a scale. Price \$16.—John F. Duby Co., 11 River street, Mattapan, Mass.

### UNION TOOL CHEST FOR MECHANICS AND REPAIRSHOPS

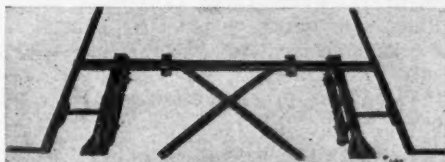
The chests are made with the tray that automatically raises with the top and always remains level and out of the way. Furnished without trays, if desired, to accommodate large tools, such as blow torches, etc., and for mechanics who prefer to make special trays to fit their needs exactly. All corners, clamps, catches and locks are brass-plated and lacquered steel, riveted



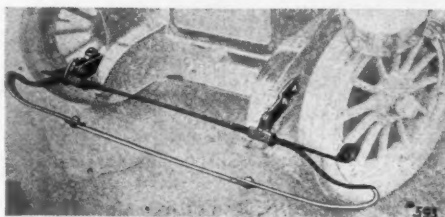
Avery compressed air jack



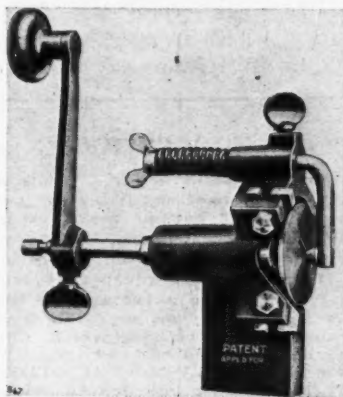
Efficiency five-in-one tool



Duby wheel gage



Procunier bumper lock



E & S universal valve refacer

on. Made in seven different lengths from 13 to 32 in. Union Tool Chest Co., 75 Mill St., Rochester, N. Y.



Union tool chest for mechanics and repairshops

### NEW AVERY COMPRESSED AIR JACK

This jack is designed especially for the garage or service station to lighten the work of jacking up cars. It operates on compressed air received from any tire inflating hose in the garage. To raise the car, open the air cock on the end of the handle and apply the air hose; to lower, close the air cock and detach the hose. The steel piston is the only moving part. Made in three sizes, to lift 2200 lbs., 4200 lbs., 8000 lbs. Price, \$18, \$22 and \$35, respectively. Avery Engineering Co., West Allis, Wis.

### EFFICIENCY FIVE-IN-ONE TOOL

The construction of this tool makes it possible to put it to five different uses. It is an eight-inch combination plier and wrench, of carbon steel, nickel-plated. The come-apart feature gives two standard size S wrenches, one-half and five-eighths in. Price, \$1.50. Efficiency Tool Co., 472 Milwaukee street, Milwaukee, Wis.

### BOWERS COMBINATION TESTER

The Bowers combination tester is designed to test engine compression, measure the pulling power of magnets or test valve springs. To find compression of each cylinder, remove all spark plugs and the screw tester in the spark plug hole and turn the engine over by hand or by starter. The compression can then be read on the graduated scale in white letters. The strength of the valve springs is ascertained in another operation by reading the figures in red. Price postpaid, \$3. Rock Sales Co., Plymouth Bldg., Minneapolis.

### E. & S. UNIVERSAL VALVE REFACER

This valve refacing tool is designed to be held in a vise when in use. Three cutter blades are employed in this device, held in place by cap screws with the cutting edges slightly off center. To operate, place valve in position and swing center into place. After the valve has been faced, tighten thumbscrew on feed rod and turn slowly to finish face. If valve has no center, swing feed rod near center and tighten thumbscrew slightly. This will hold the center true. Einfeldt & Siem, 126 West First street, Davenport, Ia.



Bowers combination tester

# Automotive Repair Shop

## Practical Maintenance Hints

### Reader Cleans Clogged Radiator With Steam

The average car owner does not realize what an important accessory the radiator is in insuring perfect motor service. The motor develops its maximum power with a heat variation of from 170 deg. to 200 deg. Fahr. It is the duty of the radiator to maintain the heat at these degrees. The radiator on every car is built to meet the specifications required for cooling by that particular motor, and if the circulation is impeded in any way, serious motor trouble will eventually develop.

The circulation lines of the honeycomb or cellular type radiator are, on the average, only .12 of an inch wide, and, being corrugated, it is readily seen how easily they can become clogged. It is practically impossible to maintain free circulation in a radiator, when such ingredients as oatmeal, cornmeal or pieces of paper, etc., are used for sealing a leak. In country service, such as touring and trucking, etc., a great number of radiators are filled with water obtained from wells, streams and roadside water holes, which contain variable amounts of alkali, gypsum and mud. Filling radiators with this surface water should be avoided as much as possible, due to its harmful effects. Alkali and gypsum are two of the worst forms of radiator encrustation (especially in the territory west of the Mississippi).

The best way to clean a radiator is to force steam through the lower hose connection, leaving the cap off. The downward flow of the water has a tendency to pack the sediment in that direction, and the flow in the opposite direction of the steam will loosen the sediment gradually and drive it out. After a radiator has been cleaned by steam and replaced on the car, it is good policy to use for several days a soapy substance of some kind in the water for filling the radiator, to make the process of cleaning thorough.

When all encrustation, sediment and the like have been well loosened, drain the radiator while the motor is running and flush several times with clean water. The water should be changed in a radiator every sixty days. Do not use raw

acids or strong lye for the purpose of cleaning any type of radiator, as they roughen the surface, thus enhancing the chance for sediment to gather and clog the radiator.

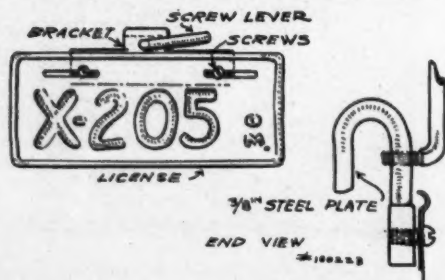
If a radiator is badly encrusted with alkali or gypsum, use the following formula for removing, this formula applying to every three gallons of water. Place one quart of muriatic acid in a 2-gal. stone jar, add  $\frac{1}{2}$  oz. of zinc,  $\frac{1}{2}$  oz. of sal ammoniac and  $\frac{1}{2}$  lb. of copper. Let the contents precipitate in a jar for 36 hours. Fill the radiator three-fourths full of water, place a blanket over the front of the radiator and run the motor with retarded spark until the water is near the boiling point. Strain the formula and pour it in the radiator. The water and formula working in conjunction will clean the encrustation from the metal.

The formula should be left in the radiator for at least three days, and the more the car is run the better the results will be. This formula is absolutely harmless as far as injuring the metal in the radiator is concerned. After the car has been run several days, drain the contents and flush thoroughly with clean water. In alkali countries where pure

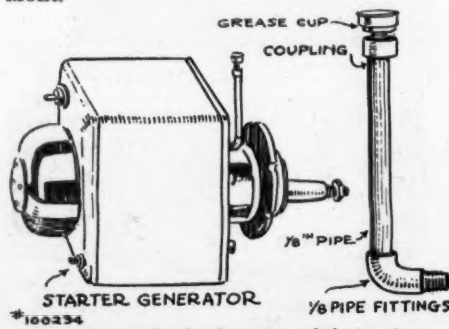
### Cooperation

COOPERATION is the keynote of the automotive industry this year and will become more important as time goes on. Motor Age is pleased to extend an invitation to its readers, wherever they may be, to contribute short articles and sketches on easy or improved ways of doing hard things, which they may have worked out and thus lend their aid in HELPING THE OTHER FELLOW. Correspondence among contributors is also strongly urged. Let's get together and make this a happy family with one end in view, that of hearty, unselfish COOPERATION.

water is unobtainable, water should be first purified by filtering through slacked lime, which will remove a large per cent of the alkali.—Ernest Hey, Billings, Mont.



Detachable license bracket holder



Simple method of getting lubrication to inaccessible parts

### Device for Detachable Hook on Eye Beams

One of the requirements in a local shop was for a detachable hook for overhead eye beams on which to place a portable chain hoist in shifting it from one car to another. The illustration shows the attachment which was made at practically no cost, using available material. A bolt was bent over at one end, the length being made about  $1\frac{1}{2}$  in. longer than the face of the beam. A piece of plate  $\frac{1}{2}$  in. thick was drilled with two holes and the end forged to hook over the flange of the beam. One nut on the threaded end of the bolt completed the details of this serviceable and strong fastener. It is equal to any load within the capacity of the hoist.

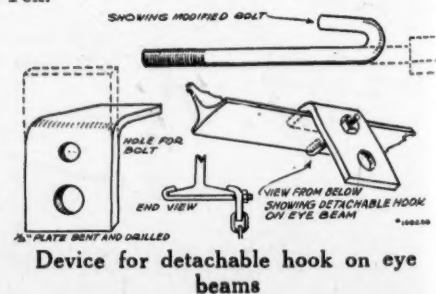
### Quick Detachable License Bracket Holder

Dealers and salesmen for automobiles or trucks will find the bracket shown in the attached drawing a simple means of quickly transferring the dealer's license plates from one demonstrating car to another.

Each license is fitted with a piece of flat stock which is tapped for a long handled clamping screw. An overhanging edge permits of hanging the license on any projection, and turning up the screw to secure it rigidly. The stock should be of  $\frac{3}{8}$  inch in thickness to permit of drilling for a thread.

### Getting Lubrication to Inaccessible Parts

There are some parts on a car that are very hard to oil or grease on account of being in some out of the way place. The illustration shows how to improve a motor generator in this respect. This machine was generally neglected for the reason that the owner could never reach the oil cups with an ordinary oil can. While this particular part of a car does not need so much oil, there are lots of other places just as hard to reach. The simple fittings consist of  $\frac{1}{8}$ -in. iron pipe or copper tubing fitted with compression couplings.—Harold Mayer, San Antonio, Tex.



Device for detachable hook on eye beams



# Make of Tires—Type of Rims Used on 1921 Passenger Cars

## Motor Age Maintenance Data Sheet No. 168

One of a series of weekly pages of information valuable to service men and dealers—save this page

Car and Model	Make of Tire	Size of Tire	Type and Make of Rim
Pierce-Arrow—			
4-pass. or less.....	Optional .....	33 x 5	Q. D. S. S. Firestone
All others.....	Optional .....	35 x 5	Q. D. S. S. Firestone
Pilot, 6-50.....	Miller .....	32 x 4½	S. S. Standard [wheels
Porter, 46.....	U. S. ....	35 x 5	S. S. Firestone or Rudge wire
Premier, 6-D.....	Goodrich, Firestone or U. S.....	33 x 5	Q. D. S. S. Firestone
Premocar—			
6-40 and 6-40A.....	Firestone .....	32 x 3½	S. S. Firestone
4-80 .....	Firestone .....	33 x 4½	..... Houk wire wheels
Raleigh, A-6-60.....	Firestone .....	32 x 4½	S. S. Houk wire wheels
Ranger Four.....	Firestone .....	32 x 4	S. S. Firestone
Reo, T-6.....	U. S. ....	33 x 4	S. S. Firestone
R. & V. Knight, J.....	Firestone and Goodrich.....	32 x 4½	Q. D. S. S. Firestone
R. & V. Knight, R.....	Firestone and Goodrich.....	32 x 4	Q. D. S. S. Firestone
Revere, C.....	Goodrich .....	32 x 4½	S. S. Stanweld
Roamer, all models.....	Firestone and Goodyear.....	32 x 4½	S. S. Hayes wire wheels
Rock Falls, 13 and 14.....	Goodyear and U. S.....	35 x 5	S. S. Firestone
Rolls Royce, 40-50.....	Optional .....	33 x 5	S. S. Detachable
Saxon, 125.....	Firestone .....	32 x 4	S. S. Firestone
Sayers Six, D. P.....	Goodyear .....	33 x 4	S. S. Cleveland Weld
Scripps-Booth, all models.....	Goodyear .....	32 x 4	S. S. Kelsey
Seneca, L and O.....	.....	30 x 3½	C. Jaxon
Severin, H.....	Fisk .....	32 x 4½	S. S. Firestone
Sheridan, 4.....	Goodyear .....	33 x 4	S. S. Jaxon
Skelton, 35.....	Miller .....	32 x 3½	S. S. Firestone
Standard, J.....	.....	34 x 4½	S. S. Firestone
Stanley Steamer.....	.....	34 x 4½	S. S. Firestone
Stanwood—			
Roadster and coupe.....	Firestone .....	32 x 4½	S. S. Houk wire wheel
Touring .....	Firestone .....	33 x 4	S. S. Stanweld
Stearns, S. K. L. 4.....	Optional .....	34 x 4½	S. S. Firestone
Stephens, 90.....	Fisk .....	33 x 4½	S. S. Stanweld
Stephens-Duryea .....	Optional .....	35 x 5	S. S. Firestone
Studebaker—			
EJ and EH.....	Optional .....	32 x 4	S. S. Kelsey
EG .....	Optional .....	33 x 4½	S. S. Kelsey
Stutz .....	Goodrich .....	32 x 4½	S. S. Houk wire wheel
Templar, A-445.....	Firestone and Goodrich.....	32 x 4	S. S. Firestone
Texan, all models.....	Firestone .....	33 x 4	S. S. Firestone
Tulsa, all models.....	Firestone .....	33 x 4	S. S. Stanweld
Velie—			
34.....	Miller .....	32 x 3½	S. S. Firestone
48.....	Miller .....	32 x 4	S. S. Firestone
Wasp, 211.....	Firestone .....	33 x 5	Q. D. S. S. Firestone
Westcott—			
C-48.....	Firestone .....	32 x 4½	S. S. Firestone
C-38.....	Firestone .....	33 x 4	S. S. Firestone
Wharton, A.....	U. S., Goodyear or Firestone.....	34 x 4½	S. S. ....
Willys-Knight—			
Touring and roadster.....	Fisk and Federal.....	33 x 4	S. S. {Stanweld or
Sedan and coupe.....	Fisk and Federal.....	34 x 4½	..... {Budd wire wheels optional
Winther, 61.....	Firestone .....	33 x 4	S. S. Firestone
Winton, 25.....	Optional .....	35 x 5	S. S. Firestone

Abbreviations: "C." clincher, "S. S." straight side, "Q. D. C." quick detachable clincher, "Dmtbl." demountable.

## Specifications of Current Passenger Car Models

NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan	NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Ace.....G	Guy.	6-3 1/2 x 5	123	32x4	\$2975	\$2975	.....	\$3680	\$3680	Maibohm.....B	Falls	6-3 1/2 x 4 1/2	116	32x4	\$1575	\$1575	\$1575	\$2395	\$2395
Ace.....H	H-S.	6-3 1/2 x 5	123	32x4	2975	2975	.....	3080	3080	Marmon.....34	Own.	6-3 1/2 x 4 1/2	136	32x4 1/2	4185	\$3985	\$3985	4875	5275
Ace.....L	L	4-3 1/2 x 5	116	32x4	2260	2260	.....	.....	.....	Maxwell.....25	Own.	4-3 1/2 x 4 1/2	109	30x3 1/2	845	815	1445	1545	
Allen.....Series 43	Own.	4-3 1/2 x 5	110	32x4	\$1385	1385	.....	.....	.....	McFarlan.....1921	Own.	4-3 1/2 x 5	140	33x5	6300	\$6300	\$6300	7500	7500
Ambassador.....R	Cont.	6-3 1/2 x 5 1/2	136	33x5	.....	\$4500	\$4500	.....	.....	Merced.....Series 5	Own.	4-3 1/2 x 5 1/2	132	32x4 1/2	3950	\$3950	\$3950	5150	5650
American.....C	H-S.	6-3 1/2 x 5	127	32x4	2195	2195	\$2350	.....	3150	Merit.....	Cont.	6-3 1/2 x 4 1/2	119	32x4	2245	.....	.....	.....	.....
Anderson.....Series 49	Cont.	6-3 1/2 x 4 1/2	120	32x4	2195	1795	1845	2795	2795	Meteor.....R & RR	Dues.	4-4 1/2 x 5	129	32x4 1/2	5500	5500	.....	.....	.....
Apperson.....8-21-S	Own.	8-3 1/2 x 5	130	34x4 1/2	.....	3000	3250	4500	4500	Metz.....M6	Rut.	6-3 1/2 x 5	120	32x4	1995	1995	.....	2795	2895
Apperson.....Anniversary	Own.	8-3 1/2 x 5	130	34x4 1/2	.....	3500	3750	.....	.....	Mitchell.....F-40	Own.	6-3 1/2 x 5	120	32x4	.....	\$1790	.....	.....	.....
Auburn.....6-51	Cont.	6-3 1/2 x 4 1/2	121	32x4	167	1695	1760	2475	2495	Mitchell.....F-40	Own.	6-3 1/2 x 5	120	32x4	\$1490	1490	.....	.....	.....
Beggs.....20T	Cont.	6-3 1/2 x 4 1/2	120	33x4	1775	1775	.....	2675	2775	Mitchell.....F-45	Own.	6-3 1/2 x 5	120	32x4	.....	1795	.....	2290	2440
Bell.....4-32	H-S.	4-3 1/2 x 5	114	31x4	.....	1495	.....	.....	.....	Moller.....A	Own.	4-2 1/2 x 4	100	27x3 1/2	2000	.....	.....	.....	.....
Bell.....6-50	H-S.	6-3 1/2 x 5	124	32x4	.....	1695	.....	.....	.....	Monroe.....S-9 & 10	Own.	4-3 1/2 x 4 1/2	115	32x3 1/2	1285	1295	.....	.....	.....
Biddle.....B1	Buda.	4-3 1/2 x 5 1/2	121	32x4	3475	3475	.....	3975	3975	Monroe.....S-11 & 12	Own.	4-3 1/2 x 4 1/2	115	32x4	1785	1785	2485	2775	2175
Birch Super-Four	H-S.	4-3 1/2 x 5	117	33x4	1195	1195	\$1245	2295	1795	Moon.....6-48	Cont.	6-3 1/2 x 4 1/2	122	32x4	.....	2485	2785	2785	3485
Birch Light Four	LeR.	4-3 1/2 x 4 1/2	108	30x3 1/2	1045	1045	.....	.....	.....	Moon.....6-68	Cont.	6-3 1/2 x 4 1/2	128	32x4 1/2	.....	4250	4250	4250	.....
Birch Light Six	H-S.	4-3 1/2 x 5	117	33x4	1395	1395	\$1445	.....	1995	Murray-Mac Six	Own.	6-3 1/2 x 5 1/2	125	34x4 1/2	4250	4250	4250	.....	.....
Bour-Davis.....21S	Cont.	6-3 1/2 x 5 1/2	126	33x4 1/2	\$2385	\$2385	2385	.....	.....	Nash.....681-7	Own.	6-3 1/2 x 5	121	33x4	1525	1545	\$1695	2395	2695
Brewster.....91	Own.	4-4 x 5 1/2	125	32x4 1/2	17000	7000	.....	10500	.....	Nash.....682	Own.	6-3 1/2 x 5	127	34x4 1/2	.....	1695	.....	.....	.....
Briscoe.....4-34	Own.	4-3 1/2 x 5	109	31x4	1085	1085	.....	1685	1685	Nash Four.....41-4	Own.	4-3 1/2 x 5	112	32x3 1/2	1175	1195	1735	1935	.....
Brook.....S-21 A	Own.	2-3 1/2 x 3 1/2	90	28x3	395	.....	.....	.....	.....	National Sextet.....BB	Own.	6-3 1/2 x 5 1/2	130	32x4 1/2	2990	\$1990	2990	3990	3990
Buick.....1922-31-35-37	Own.	4-3 1/2 x 4 1/2	109	31x4	935	975	.....	1475	1650	Nelson.....D	Own.	4-3 1/2 x 4 1/2	104	32x4	.....	1750	.....	.....	.....
Buick.....1922-41-5-6-7	Own.	6-3 1/2 x 4 1/2	118	33-4 1/2	1495	1525	.....	2135	2435	Noma.....1C	Cont.	6-3 1/2 x 4 1/2	128	32x4 1/2	2800	\$2850	\$3200	.....	3700
Buick.....1922-45-3-50	Own.	6-3 1/2 x 4 1/2	124	34x4 1/2	.....	.....	1735	2325	2635	Northway.....	Own.	6-3 1/2 x 4 1/2	128	33x5	4200	\$4200	6000	5600	5400
Bush.....E.C.6	Lyc.	4-3 1/2 x 5	116	33x4	.....	1195	.....	1750	1850	Norwalk.....430-KS	Lyc.	4-3 1/2 x 5	116	32x3 1/2	.....	1035	.....	.....	.....
Bush.....E.C.6	Rut.	6-3 1/2 x 5	116	33x4	.....	1345	.....	.....	4950	Oakland.....31-C	Own.	6-2 1/2 x 4 1/2	115	32x4	1095	1195	\$1265	1625	1725
Cadillac.....59	Own.	8-3 1/2 x 5 1/2	132	35x5	.....	3790	3790	.....	5190	Ogren.....6-60	Own.	6-3 1/2 x 5 1/2	134	33x5	\$3650	3750	3900	5000	5400
Carroll.....C	Own.	6-3 1/2 x 5	128	32x4 1/2	3185	3185	.....	.....	.....	Oldsmobile.....43-A	Own.	4-3 1/2 x 5 1/2	115	32x4	\$1145	1145	.....	1645	1845
Case.....V	Own.	6-3 1/2 x 5 1/2	126	34x4 1/2	.....	\$2250	2250	2900	3285	Oldsmobile.....37-A	Own.	6-2 1/2 x 4 1/2	112	32x4	\$1450	1450	.....	2145	2145
Chalmers.....6-30	Own.	6-3 1/2 x 4 1/2	117	32x4	1495	1545	.....	2295	2445	Oldsmobile.....46	Own.	8-2 1/2 x 4 1/2	122	33x4 1/2	.....	\$1735	1735	.....	2635
Chalmers.....6-30	Own.	6-3 1/2 x 4 1/2	122	33x4 1/2	.....	.....	1795	.....	.....	Oldsmobile.....47	Own.	8-2 1/2 x 4 1/2	115	32x4	.....	\$1625	2185	2425	.....
Champion.....Tourist	Lyc.	4-3 1/2 x 5	113	32x3 1/2	.....	1095	.....	.....	.....	Overland.....4	Own.	4-3 1/2 x 4	100	30x3 1/2	505	595	.....	850	885
Champion.....Special	H-S.	4-3 1/2 x 5	118	32x4	\$1395	1395	.....	.....	.....	Packard.....Single-Six	Own.	6-3 1/2 x 4 1/2	116	33x4 1/2	2975	2975	.....	3650	3975
Chandler.....Six	Own.	6-3 1/2 x 5	123	33x4	1785	1785	2785	2885	.....	Packard.....Twin Six	Own.	12-3 x 5	136	35x5	4850	\$4850	4850	6000	6000
Chevrolet.....490	Own.	4-3 1/2 x 4	102	30x3 1/2	525	525	.....	875	875	Paige.....6-42	Own.	6-3 1/2 x 5	119	32x4	1635	1635	.....	2450	2570
Chevrolet.....FB	Own.	4-3 1/2 x 4	110	32x4	975	975	.....	1575	1575	Paige.....6-66	Cont.	6-3 1/2 x 5	131	33x4 1/2	\$2975	3295	2875	3750	3830
Cleveland.....40	Own.	6-3 x 4 1/2	112	32x4	1295	1295	.....	2195	2295	Pan American E&F-5-55	H-S.	6-3 1/2 x 5	121	33x4	2000	2000	2100	.....	.....
Climber Four.....	H-S.	4-3 1/2 x 5	115	33x4	1450	1385	.....	.....	.....	Parenti.....1921	Own.	8-2 1/2 x 4 1/2	125	32x4	2000	2000	.....	3000	.....
Climber Six.....	S	6-3 1/2 x 5	125 1/2	32x4 1/2	2250	2250	.....	3695	3995	Patterson.....C50	Cont.	6-3 1/2 x 4 1/2	120	33x4	.....	1595	1625	2895	2895
Cole.....870	North.	8-3 1/2 x 5	127	33x5	2550	2795	3695	3995	.....	Peerless.....56-S-7	Own.	8-3 1/2 x 5	125	34x4 1/2	.....	2880	2880	3500	3790
Columbia Challenger.....	Rut.	6-3 1/2 x 5	115	32x4	.....	1195	.....	\$1995	1995	Peters.....	Own.	2-3 1/2 x 3 1/2	90	28x3	385	.....	.....	.....	.....
Columbia.....D-C&CS	Cont.	6-3 1/2 x 4 1/2	115	32x4	1475	1475	\$1475	\$2295	2350	Piedmont.....4-30	Lyc.	4-3 1/2 x 5	116	32x3 1/2	.....	970	.....	.....	.....
Comet.....C-53	Cont.	6-3 1/2 x 5 1/2	125	33x4 1/2	.....	2350	2450	3650	.....	Piedmont.....6-40	Cont.	6-3 1/2 x 4 1/2	122	32x4	.....	1255	.....	.....	.....
Commonwealth.....41	H-S.	4-3 1/2 x 5	117	32x4	.....	1395	.....	2465	.....	Pierce-Arrow.....	Own.	6-4 x 5 1/2	138	33x5	7000	\$6500	6500	8000	8500
Crawford.....21-6-10	Cont.	6-3 1/2 x 5 1/2	122 1/2	32x4	3000	3000	3000	4500	.....	Pilot.....6-45	Tecor	6-3 1/2 x 5	120	32x4	1945	1885	.....	3350	3400
Crow-Elkhart.....L63-65	Lyc.	4-3 1/2 x 5	117	32x3 1/2	1295	1295	.....	.....	.....	Pilot.....6-50	H-S.	6-3 1/2 x 5	126	32x4 1/2	2285	2285	2335	3350	3400
Crow-Elkhart.....S63-65	H-S.	6-3 1/2 x 5	117	33x4	\$1545	1545	.....	2395	.....	Porter.....6-40	Own.	4-4 1/2 x 5 1/2	142	35x5	6750	Chassis Price	.....	.....	.....
Daniels.....D-19	Own.	8-3 1/2 x 5 1/2	132	34x4 1/2	\$3550	\$3550	6250	6950	.....	Premier.....6-D	Own.	6-3 1/2 x 5 1/2	126 1/2	33x5	3790	\$3690	3890	4690	5190
Davis.....61-67	Cont.	6-3 1/2 x 4 1/2	120	32x4	\$1995	1995	\$1995	2795	2795	Premcar.....6-40 A	Falls.	6-3 1/2 x 4 1/2	117	33x4	1295	1295	.....	.....	.....
Dispatch.....	Wisc.	4-3 1/2 x 5	120	34x4	1250	1350	1350	1525	1575	Raleigh.....A-6-60	H-S.	6-3 1/2 x 5	122	32x4 1/2	2250	2250	.....	3100	3200
Dixie Flyer.....H-S-70	H-S.	4-3 1/2 x 5	112	32x4	1445	1445	1945	2295	2345	R & V Knight.....R	Own.	4-3 1/2 x 5	116	32x4	.....	2150	.....	2850	2950
Dodge Brothers.....	Own.	4-3 1/2 x 4 1/2	114	32x4	935	985	.....	1585	1785	R & V Knight.....J	Own.	6-3 1/2 x 5 1/2	127	32x4 1/2	3350	\$3350	3350	4000	4200
Dorris.....6-80	Own.	6-4 x 5	132	33x5	.....	\$4785	4785	5800	6090	Reo Series A.....T-6	Own.	6-3 1/2 x 5	120	33x4	1650	1650	.....	2700	2750
Dort.....17-12	D-Ly.	4-3 1/2 x 5	108	31x4	985	985	.....	1535	1685	ReVer.....C	Dues.	4-4 1/2 x 6	131	32x4 1/2	4850	4650	\$4650	.....	6500
Driggs.....	Own.	4-2 1/2 x 4 1/2	104	30x3 1/2	1275	1275	.....	1975	.....	Roamer.....6-54-E	Dues.	4-4 1/2 x 6	128	32x4 1/2	2750	\$2650	2750	\$3850	3950
Du Pont.....A	Own.	4-3 1/2 x 5 1/2	124	32x4 1/2	3400	\$3400	.....	4900	.....	Roamer.....4-75-E	Dues.	4-4 1/2 x 6	128	32x4 1/2	3850	3650	.....	.....	.....
Durant.....A-22	Cont.	4-3 1/2 x 4 1/2	109	31x4	.....	890	.....	1365	1365	Rolls-Royce.....	Own.	6-4 1/2 x 4 1/2	143 1/2	33x5	U. S. Chassis Price	.....	11750	.....	.....
Elcar.....K-4	Lyc.	4-3 1/2 x 5	117	33x4	1195	1195	.....	.....	.....	Romer.....	Cont.	6-3 1/2 x 4 1/2	120	33x4	2000	2000	2100	2450	2750
Elcar.....7-R	Cont.	6-3 1/2 x 4 1/2	117	33x4	\$1595	1595	\$1195	2395	2495	Saxon.....125	Own.	4-3 1/2 x 5	112	32x4	1545	1405	.....	2295	2295
Elgin.....K-1	Falls.	6-3 1/2 x 4 1/2	118	33x4	1595	1495	\$1595	2395	2395	Sayers Six.....DP	Cont.	6-3 1/2 x 4 1/2	118	33x4	1945	1495	.....	.....	2995
Essex.....	Own.	4-3 1/2 x 5	108 1/2	32x4	1375	1375	.....	1880	2230	Scripps-Booth.....B-39-42	North.	6-2 1/2 x 4 1/2	115	32x4	\$1275	1295	.....	1950	2100
Fergus.....S-5-21	Own.	6-3 1/2 x 5	126	33x4 1/2	.....	Chassis Price	8500	.....	.....	Scripps-Booth.....F-43-46	North.	6-3 1/2 x 4 1/2	115	32x4	1470	1490	.....	2350	2375
Ferris.....C-20	Cont.	6-3 1/2 x 5 1/2	130	32x4 1/2	2695	.....	\$2595	3695	.....	Seneca.....L & O	LeR.	4-3 1/2 x 4 1/2	108	30x3 1/2	1045	1045	.....	.....	



## Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive
				Front	Rear						Front	Rear						Front	Rear	
Acason	3 1/2	\$1650	3 1/2 x 5	34 x 5 1/2	34 x 5 1/2	W	Corbitt, A	3 1/2	\$4100	4 1/2 x 5 1/2	36 x 5	36 x 10	W	Gary, J	2 1/2	\$3150	4 1/2 x 5 1/2	36 x 4	36 x 7	W
Acason, R	1 1/2	2200	3 1/2 x 5 1/2	36 x 3 1/2	36 x 5	W	Corbitt, AA	5	5000	4 1/2 x 6	36 x 6	40 x 6	W	Gary, K	3 1/2	4050	4 1/2 x 6	36 x 5	40 x 5 1/2	W
Acason, RB	2 1/2	2485	3 1/2 x 5 1/2	36 x 3 1/2	36 x 6	W	Cyclone A	1 1/2	2685	3 1/2 x 5	34 x 5 1/2	36 x 10	I	Gary, M	5	5150	5 x 6 1/2	36 x 6	40 x 6 1/2	W
Acason, H	1 1/2	3205	3 1/2 x 5 1/2	36 x 3 1/2	36 x 8	W								Geraix M	1 1/2	3100	4 x 5 1/2	36 x 3 1/2	36 x 7	W
Acason, L	3 1/2	4295	4 1/2 x 5 1/2	36 x 5	36 x 10	W	Dart, S	1 1/2	....	3 1/2 x 5 1/2	34 x 3 1/2	34 x 6	W	Geraix K	2 1/2	3500	4 1/2 x 5 1/2	36 x 4	36 x 8	W
Acason, M	5	5250	5 x 6 1/2	36 x 6	40 x 12	W	Dart, M	2 1/2	....	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Geraix	3 1/2	4500	4 1/2 x 5 1/2	36 x 5	40 x 12	W
Act, C	1 1/2	2295	3 1/2 x 5 1/2	34 x 3 1/2	34 x 5	W	Dart, W	3 1/2	....	4 1/2 x 6	36 x 5	36 x 10	W	Giant, 15-A	1 1/2	2250	3 1/2 x 5	34 x 3 1/2	34 x 5	W
Ace, A	2 1/2	2795	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Day-Elder, A	1	2100	3 1/2 x 5	34 x 3 1/2	34 x 4	W	Giant, 16	2	3050	4 1/2 x 5 1/2	36 x 4	36 x 7	W
Acme, G	3 1/2	....	3 1/2 x 5	35 x 5 1/2	35 x 5 1/2	W	Day-Elder, B	1 1/2	2300	3 1/2 x 5	34 x 3 1/2	34 x 5	W	Giant, 17	3 1/2	4150	4 1/2 x 5 1/2	36 x 5	36 x 5 1/2	W
Acme, B	1	....	3 1/2 x 5	34 x 3 1/2	34 x 5	W	Day-Elder, D	2	2750	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Globe D-20	3 1/2	1495	3 1/2 x 5	33 x 4 1/2	33 x 4 1/2	B
Acme, F	1 1/2	....	3 1/2 x 5	34 x 3 1/2	34 x 5	W	Day-Elder, C	2 1/2	3025	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Globe	1	1495	3 1/2 x 5	33 x 5	33 x 5	B
Acme, A	2	....	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Day-Elder, F	3 1/2	3750	4 1/2 x 5 1/2	36 x 5	36 x 5 1/2	W	Golden West, GH	3	5000	4 1/2 x 6	36 x 7	36 x 7	W
Acme, AC	2 1/2	....	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Day-Elder, E	5	4250	4 1/2 x 6	36 x 5	40 x 6 1/2	W	Golden West, G	3 1/2	4500	4 1/2 x 5 1/2	36 x 6	36 x 6	W
Acme, C	3 1/2	....	4 1/2 x 5 1/2	36 x 5	40 x 10	W	Dearborn, E	1	1700	3 1/2 x 5	35 x 5 1/2	35 x 5 1/2	W	Golden West, H	3 1/2	5000	4 1/2 x 6	36 x 6	36 x 6	W
Acme, E	5	....	4 1/2 x 6	36 x 6	40 x 12	W	Dearborn, FX	1 1/2	2300	3 1/2 x 5 1/2	34 x 4	34 x 5	W	Golden West, K	4	5500	4 1/2 x 6	36 x 6	36 x 6	W
Akr'n Multi-Trk-20	1	1995	4 x 5 1/2	34 x 5	34 x 5	B	Dearborn, F	1 1/2	2180	3 1/2 x 5 1/2	34 x 4	34 x 5	W	Golden West, KA	7	6000	5 1/2 x 6	36 x 6	36 x 6	W
American, 25	2 1/2	3350	4 x 6	36 x 4	36 x 4	W	Dearborn, 48	2	2590	3 1/2 x 5 1/2	35 x 5 1/2	34 x 7 1/2	W	Golden West, HA	7	6000	4 1/2 x 6	36 x 6	36 x 10	W
American, 40	4	4275	4 1/2 x 6	36 x 5	36 x 5 1/2	W	Defiance, G	1	1695	3 1/2 x 5	35 x 5 1/2	35 x 5 1/2	I	Graham Bros. A	1 1/2	2495	3 1/2 x 5	35 x 5	35 x 5	I
Apex, G	1	1450	3 1/2 x 5	33 x 5 1/2	33 x 5 1/2	I	Defiance, D	1 1/2	2095	3 1/2 x 5	35 x 5 1/2	36 x 7 1/2	I	Gramm-Bern, 10	1	1495	3 1/2 x 5	35 x 5	35 x 5	I
Apex, D	1 1/2	1915	3 1/2 x 5 1/2	34 x 3 1/2	34 x 4	I	Defiance, E	2	2275	3 1/2 x 5	35 x 5 1/2	36 x 7 1/2	I	Gramm-Bern, 15	1 1/2	2050	3 1/2 x 5	36 x 3 1/2	36 x 5	I
Apex, E	2 1/2	2695	4 1/2 x 5 1/2	36 x 4	36 x 7	I	DeKalb, E2 1/2	2 1/2	2600	4 1/2 x 5 1/2	36 x 4	36 x 6	W	Gramm-Bern, 65	1 1/2	2725	3 1/2 x 5	36 x 3 1/2	36 x 5	W
Apex, F	3 1/2	3975	4 1/2 x 5 1/2	36 x 5	36 x 10	I	DeKalb, E2	2 1/2	2250	4 1/2 x 5 1/2	36 x 3 1/2	36 x 5	W	Gramm-Bern, 20	2	3175	4 1/2 x 5 1/2	36 x 4	36 x 7	W
Armleder, 20	1	....	3 1/2 x 5 1/2	34 x 3 1/2	34 x 5	W	DeMartini 1 1/2	1 1/2	2600	3 1/2 x 5	34 x 3 1/2	34 x 6	W	Gramm-Bern, 25	2 1/2	3575	4 1/2 x 5 1/2	36 x 4	36 x 7	W
Armleder, HW	2 1/2	....	4 1/2 x 5 1/2	36 x 4	36 x 7	W	DeMartini 2	2	3300	4 x 5 1/2	36 x 3 1/2	36 x 7	W	Gramm-Bern, 35	3 1/2	4375	4 1/2 x 5 1/2	36 x 5	40 x 5 1/2	W
Armleder, KW	3 1/2	....	4 1/2 x 6	36 x 5	36 x 5 1/2	W	DeMartini 3	3	4250	4 1/2 x 5 1/2	36 x 4	36 x 10	W	Gramm-Bern, 50	5	5275	4 1/2 x 6	36 x 6	40 x 6 1/2	W
Atco, B	1 1/2	....	3 1/2 x 5 1/2	34 x 3 1/2	34 x 5	I	DeMartini 4	4	4800	4 1/2 x 6	36 x 5	36 x 12	W							
Atco, B1	1 1/2	....	3 1/2 x 5 1/2	34 x 3 1/2	34 x 5	I	Denby, 31	3 1/2	1625	3 1/2 x 5	35 x 5	35 x 5	B	Hahn, J4	1	....	3 1/2 x 5	34 x 5	34 x 5	W
Atco, A	2 1/2	....	4 1/2 x 5 1/2	36 x 4	36 x 8	W	Denby, 33	1 1/2	2300	3 1/2 x 5	35 x 5 1/2	36 x 7 1/2	I	Hahn, CD	1 1/2	....	4 1/2 x 5 1/2	36 x 4	36 x 8	W
Atlas, M.D	1	1550	3 1/2 x 5	32 x 4 1/2	32 x 4 1/2	I	Denby, 34	2	2600	3 1/2 x 5	36 x 3 1/2	36 x 6	I	Hahn, EE	2 1/2	....	4 1/2 x 5 1/2	36 x 4	36 x 8	W
Atterbury, 20R	1 1/2	2775	3 1/2 x 5	34 x 3 1/2	34 x 5	W	Denby, 35	3	3300	4 1/2 x 5 1/2	36 x 4	36 x 7	I	Hahn, F	3 1/2	....	4 1/2 x 5 1/2	36 x 5	36 x 10	W
Atterbury, 7CX	2 1/2	3375	4 1/2 x 5 1/2	36 x 4	36 x 4	W	Denby, 27	4	4200	4 1/2 x 5 1/2	36 x 5	36 x 5 1/2	I	Hahn, EF	5	....	4 1/2 x 6	36 x 6	40 x 12	W
Atterbury, 7D	2 1/2	4175	4 1/2 x 5 1/2	36 x 5	40 x 5 1/2	W	Dependable, A	3 1/2	4850	4 1/2 x 5 1/2	36 x 6	40 x 6 1/2	I	Hal Fur, E	1	2350	4 x 5	35 x 5 1/2	35 x 5 1/2	W
Atterbury, 8E	5	5575	4 1/2 x 6	36 x 5	40 x 6 1/2	W	Dependable, C	1 1/2	1650	3 1/2 x 5 1/2	34 x 5	36 x 6	W	Hal Fur, B	2 1/2	3250	4 1/2 x 5 1/2	35 x 5	38 x 7	W
Autocar, 21UF	1 1/2	2300	4 1/2 x 5 1/2	34 x 4	34 x 5	D	Dependable, D	2 1/2	2350	3 1/2 x 5 1/2	34 x 3 1/2	34 x 5	W	Hal Fur, F	3 1/2	4250	4 1/2 x 5 1/2	36 x 6	40 x 10 1/2	W
Autocar, 21UG	1 1/2	2400	4 1/2 x 5 1/2	34 x 4	34 x 5	D	Dependable, E	2	2650	4 x 5 1/2	34 x 5	36 x 6	W	Hall	1 1/2	3100	3 1/2 x 5	34 x 5 1/2	34 x 7 1/2	W
Autocar, 26Y	....	4350	4 1/2 x 5 1/2	36 x 6	36 x 12	D	Dependable, F	2 1/2	2950	4 1/2 x 5 1/2	36 x 4	36 x 7	W	Hall	2 1/2	3275	4 1/2 x 5 1/2	36 x 4	36 x 6	W
Autocar, 26-B	....	4500	4 1/2 x 5 1/2	36 x 6	36 x 12	D	Dependable, G	3 1/2	3550	4 1/2 x 6	36 x 6	38 x 7	W	Hall	3 1/2	4100	4 1/2 x 5 1/2	36 x 5	36 x 5 1/2	W
Available, H1 1/2	1 1/2	2475	4 x 5 1/2	36 x 3 1/2	36 x 5	W	Diamond T, O	1	2500	3 1/2 x 5 1/2	34 x 5 1/2	36 x 8 1/2	W	Hall	5	5100	4 1/2 x 5 1/2	36 x 5	40 x 6 1/2	W
Available, H2	2	2775	4 x 5 1/2	36 x 3 1/2	36 x 6	W	Diamond T, FS	1 1/2	2900	3 1/2 x 5 1/2	36 x 3 1/2	36 x 5	W	Hall	7	5100	4 1/2 x 5 1/2	36 x 5	40 x 6 1/2	W
Available, H2 1/2	2 1/2	3475	4 x 5 1/2	36 x 4	36 x 8	W	Diamond T, T	1 1/2	2650	3 1/2 x 5 1/2	36 x 3 1/2	36 x 5	W	Harvey, WEA	1 1/2	2550	4 1/2 x 5 1/2	34 x 3 1/2	34 x 5	I
Available, H3 1/2	3 1/2	4475	4 1/2 x 5 1/2	36 x 5	40 x 5 1/2	W	Diamond T, U	2	3285	4 x 5 1/2	36 x 4	36 x 7	W	Harvey	2 1/2	2950	4 1/2 x 5 1/2	34 x 4	34 x 7	W
Available, H5	5	5375	4 1/2 x 6	36 x 6	40 x 12	W	Diamond T, K	3 1/2	4675	4 1/2 x 5 1/2	36 x 5	36 x 5 1/2	W	Harvey, WFA	2 1/2	3300	4 1/2 x 5 1/2	36 x 4	36 x 7	W
Available, H7	7	6000	5 x 6	36 x 6	40 x 14	B	Diamond T, EL	5	5400	4 1/2 x 5 1/2	36 x 6	40 x 6 1/2	W	Harvey, WHA	3 1/2	3950	4 1/2 x 6	36 x 5	36 x 5 1/2	W
Avery	1	....	3 x 4	34 x 5 1/2	34 x 5 1/2	I	Diamond T, S	5	6650	4 1/2 x 6	36 x 6	40 x 6 1/2	W	Harvey, WKA	5	4500	4 1/2 x 6	36 x 6	40 x 6 1/2	W
Beck, A. Jr.	1	1950	3 1/2 x 5	34 x 3 1/2	34 x 4	I	Diehl, A	1	....	3 1/2 x 5	34 x 4 1/2	35 x 5	I	Hawkeye, K	1 1/2	1850	3 1/2 x 5 1/2	34 x 3 1/2	34 x 5	I
Beck, C	2	2550	4 1/2 x 5 1/2	36 x 4	36 x 6	I	Diehl, B	1 1/2	....	3 1/2 x 5	36 x 6	36 x 6	I	Hawkeye, M	2</					

## Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive
				Front	Rear						Front	Rear						Front	Rear	
Kelly-S, K-45	4	\$4550	4 1/2 x 6 1/2	36x5	40x6d	C	Ogden, E	2 1/2	\$3250	4 1/2 x 5 1/2	36x4	36x7	W	Signal, NF	1	2475	4 1/2 x 5	34x5 1/2	36x6 1/2	W
Kelly-S, K-50	5	4900	4 1/2 x 6 1/2	36x6	40x6d	C	Old Hickory, W	1 1/2	2175	3 1/2 x 5	36x3 1/2	36x4	W	Signal, H	1 1/2	2925	4 1/2 x 5 1/2	34x4	36x6	W
Ke 15-S, K-60	6	5100	4 1/2 x 6 1/2	36x6	40x7d	C	Old Reliable, A	1 1/2	2350	4 x 5	34x4	36x6	W	Signal, J	2 1/2	3275	4 1/2 x 5 1/2	34x4	36x8	W
Keystone, 40	2	2450	3 1/2 x 5 1/2	34x5 1/2	38x7 1/2	I	Old Reliable, B	2 1/2	3500	4 1/2 x 6	34x4	36x4d	W	Signal, M	3 1/2	4275	4 1/2 x 5 1/2	36x5	40x5d	W
Kimball, AB	2	3675	4 x 6	36x4	36x7	W	Old Reliable, C	3 1/2	4250	4 1/2 x 6	36x5	36x5d	W	Signal, R	5	5300	4 1/2 x 6	36x6	40x6d	W
Kimball, AC	2 1/2	3975	4 1/2 x 6	36x4	36x8	W	Old Reliable, D	5	5250	4 1/2 x 6	36x6	40x6d	W	Southern, 10	1	2090	3 1/2 x 5	34x3 1/2	34x4	W
Kimball, AK	3	4500	4 1/2 x 6	36x4	36x10	W	Old Reliable, KLM	7	6000	4 1/2 x 6 1/2	36x6	40x7d	C	Southern, 15	1 1/2	2590	3 1/2 x 5 1/2	36x6 1/2	34x4	W
Kimball, AE	4	5000	4 1/2 x 6	36x5	40x12	W	Oldsmobile Econ.	1	1095	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	I	Southern, 20	2	2990	4 1/2 x 5 1/2	36x6 1/2	40x8	W
Kimball, AF	5	5975	5 x 6	36x6	40x7d	W	Olympic, A	2 1/2	3500	4 1/2 x 5 1/2	36x4	36x7	W	Standard, 1-K	1-1 1/2	1950	3 1/2 x 5	34x3 1/2	34x5	W
Kissel, Express	1	1985 1/2	3 1/2 x 5 1/2	34x5 1/2	34x5 1/2	W	Oneida, A-9	1 1/2	2350	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Standard, 76	2 1/2-3	3100	4 1/2 x 5 1/2	36x4	36x7	W
Kissel, Utility	1 1/2	2775	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Oneida, B-9	1 1/2	2915	4 x 5 1/2	36x4	36x7	W	Standard, 66	3 1/2-4	4000	4 1/2 x 5 1/2	36x5	36x10	W
Kissel, Freight	2 1/2	3475	4 1/2 x 5 1/2	36x4	36x7	W	Oneida, C-9	2 1/2	3390	4 x 5 1/2	36x4	36x7	W	Standard, 5-K	5-7	5250	4 1/2 x 6	36x6	40x12	W
Kissel, H. B.	4	4475	4 1/2 x 5 1/2	36x5	36x5d	W	Oneida, D-9	3 1/2	4345	4 1/2 x 5 1/2	36x5	36x10	W	Sterling, 1 1/2	1 1/2	3200	4 x 5 1/2	36x3 1/2	36x5	W
Kleiber, AA	1	2000	4 1/2 x 5 1/2	34x3 1/2	34x5	W	One, D, E-9	5	5460	4 1/2 x 5 1/2	36x6	40x12	W	Sterling, 2	2	3500	4 x 5 1/2	36x4	36x6	W
Kleiber, A	1 1/2	3100	4 1/2 x 5 1/2	36x4	36x6	W	Oshkosh, A	2	3750	3 1/2 x 5	36x6	36x6 1/2	W	Sterling, 2 1/2	2 1/2	3650	4 1/2 x 5 1/2	36x4	36x4d	W
Kleiber, BB	2	3600	4 1/2 x 5 1/2	36x4	36x7	W	Oshkosh, AA	2	3850	3 1/2 x 5	36x6	36x6 1/2	W	Sterling, 3 1/2	3 1/2	4650	4 1/2 x 5 1/2	36x5	40x5d	W
Kleiber, B	2 1/2	3950	4 1/2 x 5 1/2	36x5	36x8	W	Oshkosh, B	2 1/2	4150	4 x 5 1/2	38x7 1/2	38x7 1/2	W	Sterling, 5-W	5	5500	5 x 6 1/2	36x6	40x6d	W
Kleiber, C	3 1/2	4600	4 1/2 x 5 1/2	36x5	36x5d	W	Oshkosh, BB	2 1/2	4300	4 x 5 1/2	38x7 1/2	38x7 1/2	W	Sterling, 5-C	5	6000	5 x 6 1/2	36x6	40x6d	C
Kleiber, D	5	5300	5 x 6 1/2	36x6	40x12	W	Packard, EC	...	3500	4 1/2 x 5 1/2	36x4	36x7	W	Sterling, 7 1/2	7 1/2	6500	5 x 6 1/2	36x6	40x7d	C
Koehler, D	1 1/2	1885	3 1/2 x 5	34x3 1/2	34x5	W	Packard, ED	...	4100	4 1/2 x 5 1/2	36x5	36x5d	W	Stewart, 14	1 1/2	1395	3 1/2 x 5 1/2	32x4 1/2	32x4 1/2	I
Koehler, M	2 1/2	2875	4 x 5 1/2	36x4	36x7	W	Packard, EF	...	4500	5 x 5 1/2	36x6	40x6d	W	Stewart, 15	1 1/2	1875	3 1/2 x 5	35x5 1/2	35x5 1/2	I
Koehler, MCS	3 1/2	2975	4 x 5 1/2	36x4	36x7	W	Packard, EX	...	4000	4 1/2 x 5 1/2	36x6	40x6 1/2	W	Stewart, 9	1 1/2	2200	3 1/2 x 5	34x3 1/2	34x5	I
Koehler, F	3 1/2	3985	4 1/2 x 5 1/2	36x5	36x10	W	Paige, 52-19	1 1/2	2890	4 x 5 1/2	34x3 1/2	34x5	W	Stewart, 7	2	2800	3 1/2 x 5	34x4	34x7	I
Koehler, MT, Trac	5	2975	4 x 5 1/2	36x4	36x7	W	Paige, 54-20	2 1/2	3400	4 1/2 x 5 1/2	34x4	34x8	W	Stewart, 7-X	2 1/2	2950	4 1/2 x 5 1/2	34x4	34x7	I
L.M.C., 2-20	2 1/2	2540	4 1/2 x 5 1/2	36x4	36x4d	I	Paige, 51-18	3 1/2	4235	4 1/2 x 5 1/2	36x5	36x5d	W	Stewart, 10	3 1/2	3850	4 1/2 x 5 1/2	36x5	36x5d	I
Lange, B	2 1/2	3350	4 1/2 x 5 1/2	36x4	36x6	W	Parker, F20	2	3500	4 x 6	34x4	36x4d	W	Stewart, 10-X	3 1/2	3850	4 1/2 x 5 1/2	36x5	36x5d	I
Larrabee, XZ	1 1/2	1925	3 1/2 x 4 1/2	34x5 1/2	34x5 1/2	B	Parker, J20	3 1/2	4400	4 1/2 x 6	36x5	40x5d	W	Stoughton, A	1	1995	3 1/2 x 5	34x4 1/2	35x5 1/2	W
Larrabee, U	2 1/2	2400	3 1/2 x 5 1/2	34x5 1/2	34x5	W	Parker, M20	5	5500	4 1/2 x 6	36x6	40x6d	W	Stoughton, B	1 1/2	2350	3 1/2 x 5 1/2	36x3 1/2	36x5	W
Larrabee, SK	3 1/2	3200	3 1/2 x 5 1/2	36x4	36x7	W	Patriot, Revore	...	1785	3 1/2 x 5	35x5 1/2	35x5 1/2	W	Stoughton, C	2	1240	3 1/2 x 5	34x4 1/2	34x4 1/2	W
Larrabee, FL	3 1/2	4000	4 1/2 x 5 1/2	36x5	36x5d	W	Patriot, Lincoln	1 1/2	2450	4 x 5 1/2	34x3 1/2	34x5	W	Stoughton, D	2	2800	4 x 5 1/2	36x4	36x7	W
Larrabee, FW	5	4900	4 1/2 x 5 1/2	36x6	40x6d	W	Patriot, Washg'tn	2 1/2	3450	4 1/2 x 5 1/2	36x4	36x7	W	Stoughton, E	3	3600	4 1/2 x 5 1/2	36x5 1/2	36x5 1/2	W
Lion, L	1	2350	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	W	Piedmont, 4-30	1 1/2	1685	3 1/2 x 5	34x4 1/2	34x4 1/2	W	Sullivan, E	2	3350	4 1/2 x 5 1/2	36x4	36x7	W
Luedinghaus, C	1 1/2	2100	3 1/2 x 5 1/2	34x3 1/2	34x5	W	Pierce-Arrow	2	2200	4 x 5 1/2	36x4	36x4d	W	Sullivan, H	3 1/2	4650	4 1/2 x 6	36x5	36x5d	W
Luedinghaus, W	2-2 1/2	2700	3 1/2 x 5 1/2	34x3 1/2	34x5	W	Pierce-Arrow	3 1/2	4350	4 1/2 x 5 1/2	36x5	36x5d	W	Superior, D	1	1650	3 1/2 x 5	34x4 1/2	34x4	I
Luedinghaus, W	2-2 1/2	3150	4 1/2 x 5 1/2	36x4	36x7	W	Pioneer, 59	5	4850	4 1/2 x 5 1/2	36x5	40x6d	W	Superior, E	2	2600	4 1/2 x 5 1/2	36x4	36x6	I
Maccar, L	1 1/2	2925	4 1/2 x 5 1/2	36x4	36x6	W	Pittsburgher, C-21	2 1/2-3	3500	4 1/2 x 5 1/2	36x5	40x6d	W	Super Truck, 50	2 1/2	3300	4 x 6	36x4	36x8	W
Maccar, H-2	2 1/2	3650	4 1/2 x 5 1/2	36x5	36x4d	W	Pony	1 1/2	400	3 1/2 x 4	28x3 1/2	28x3 1/2	C	Super Truck, 70	3	4300	4 1/2 x 6	36x5	40x5d	W
Maccar, M-2	3 1/2	4500	4 1/2 x 5 1/2	36x5	36x5d	W	Power, F	1 1/2	...	3 1/2 x 5 1/2	36x6	36x6	W	Super Truck, 100	5	5300	5 x 6	36x5	40x12	W
Maccar, G	5	5500	4 1/2 x 5 1/2	36x5	40x6d	W	Power, C	3 1/2	...	4 1/2 x 5 1/2	36x6	40x10	W	Super Truck 150	7 1/2	6300	5 x 6	36x6	40x7d	W
MacDonald, A	7 1/2	5750	4 1/2 x 6	40x7	40x14	I	Premacon, B-143	1 1/2	2475	3 1/2 x 5	36x6	36x6 1/2	W	Texas, A38	...	1095	3 1/2 x 5	33x4	33x4	I
Mack, AB D.R.	1 1/2	3450	4 x 5	36x4	36x3 1/2	D	Rainier, R-11	3/4	2150	3 1/2 x 5	35x5 1/2	35x5 1/2	W	Texas, TK39	1 1/2	1550	3 1/2 x 5	36x6	38x7	W
Mack, AB	2 1/2	3400	4 x 5	36x4	36x4d	C	Rainier, R-19	1	2350	3 1/2 x 5	34x3 1/2	34x4	W	Tiffin, GW	1 1/2	2400	3 1/2 x 5	36x3 1/2	36x5	W
Mack, AB Chain	1 1/2	3000	4 x 5	36x4	36x3 1/2	C	Rainier, R-16	1 1/2	2600	3 1/2 x 5	34x3 1/2	34x5	W	Tiffin, MW	2 1/2	3100	4 1/2 x 5 1/2	36x4	26x3 1/2	W
Mack, AB Chain	2	3300	4 x 5	36x4	36x4d	C	Rainier, R-18	2	2950	4 1/2 x 5 1/2	34x4	34x6	W	Tiffin, PW	2 1/2	4100	4 1/2 x 5 1/2	36x5	40x5d	W
Mack, AB D.R.	2	3750	4 x 5	36x4	36x4d	C	Rainier, R-20	2 1/2	3600	4 1/2 x 5 1/2	34x4	34x7	W	Tiffin, F50	5	4800	4 1/2 x 6	36x6	40x6d	W
Mack, AC Chain	3 1/2	4950	5 x 6	36x5	40x5d	C	Rainier, R-15	3 1/2	4503	4 1/2 x 5 1/2	36x5	36x5d	W	Titan, HT	3 1/2	4550	4 1/2 x 6	36x4	40x5d	I
Mack, AC Chain	5	5500	5 x 6	36x6	40x6d	C	Rainier, R17	5	5250	4 1/2 x 6	36x6	36x6d	W	Titan, HD	5	5400	4 1/2 x 6	36x		



# Specifications of Current Motor Truck Models—Continued

NAME AND MODEL						NAME AND MODEL						NAME AND MODEL								
Tons Capacity		Chassis Price	Bore and Stroke	TIRES		Final Drive	Tons Capacity		Chassis Price	Bore and Stroke	TIRES		Final Drive	Tons Capacity		Chassis Price	Bore and Stroke	TIRES		Final Drive
				Front	Rear						Front	Rear						Front	Rear	
Watson, E	1	\$1865	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	W	Wichita, S	5	\$3000	4 1/2 x 6	36x6	40x6d	W	Winther, 39	1 1/2	\$2450	3 1/2 x 5	34x3 1/2	34x5	W
Watson, N	1 1/2	4250	4 1/2 x 5 1/2	36x5 1/2	36x10	W	Wilcox, AA	1	2100	3 1/2 x 5 1/2	36x4	36x4	W	Winther, 49	2	3250	4 x 5	34x4	34x4d	W
Western, W1 1/2	1 1/2	2550	4 1/2 x 5 1/2	36x3 1/2	36x5	W	Wilcox, B	1 1/2	2775	4 1/2 x 5	36x4	36x5	W	Winther, 50	2 1/2	3995	4 x 5	34x7 1/2	42x9 1/2	W
Western, L1 1/2	1 1/2	2550	3 1/2 x 5	36x3 1/2	36x5	W	Wilcox, D	2 1/2	3300	4 1/2 x 5	36x4	36x5	W	Winther, 70	3 1/2	4200	4 x 5	36x5	36x5d	W
Western, W2 1/2	2 1/2	3250	4 1/2 x 5 1/2	36x3 1/2	36x5	W	Wilcox, E	3 1/2	4250	4 1/2 x 5	36x5	36x5d	W	Winther, 450	2 1/2	3690	4 x 5	34x5	36x5	W
Western, L2 1/2	2 1/2	3250	4 1/2 x 5 1/2	36x4	36x7	W	Wilcox, F	5	5200	4 1/2 x 5 1/2	36x5	40x6d	W	Winther, 109	5	5250	4 1/2 x 5	36x6	40x5d	W
Western, W3 1/2	3 1/2	4250	4 1/2 x 5 1/2	36x5	40x5d	W	Wilson, F	1 1/2	2270	3 1/2 x 5	36x3 1/2	36x5	W	Winther, 140	7	5900	5 x 6	36x6	40x7d	W
White, 15	1 1/2	2400	3 1/2 x 5 1/2	34x5 1/2	34x5 1/2	B	Wilson, EA	2 1/2	2825	4 1/2 x 5 1/2	36x4	36x7	W	Wisconsin B	1	1950	4 x 5 1/2	34x5 1/2	34x5 1/2	W
White, 20	2	3250	3 1/2 x 5 1/2	36x4	36x7	D	Wilson, G	3 1/2	3685	4 1/2 x 5 1/2	36x5	36x5d	W	Wisconsin C	1 1/2	2500	4 1/2 x 5 1/2	36x6	36x10	W
White, 40	3 1/2	4200	3 1/2 x 5 1/2	36x5	40x5d	D	Wilson, H	5	4520	4 1/2 x 5 1/2	36x6	40x6d	W	Wisconsin D	1 1/2	3500	4 1/2 x 5 1/2	36x6	36x12 1/2	W
White, 45	5	4500	4 1/2 x 5 1/2	36x6	40x6d	D	Winther, 751	1	1795	4 1/2 x 5	34x4 1/2	35x5 1/2	W	Wisconsin E	1 1/2	4000	5 x 6 1/2	36x6	36x10	W
White Hick, E	1	2450	3 1/2 x 5	36x4	36x5	W	Winther, 430	1 1/2	2850	3 1/2 x 5	32x4	32x4	W	Witt-Will, N	1 1/2	2750	3 1/2 x 5	36x3 1/2	36x5	W
White Hick, H	1 1/2	2750	3 1/2 x 5	36x3 1/2	36x5	W								Witt-Will, P	1 1/2	3250	4 1/2 x 5 1/2	36x3 1/2	36x7	W
White Hick, K	2 1/2	3350	4 1/2 x 5 1/2	36x4	36x7	W								Wolverine, J	1 1/2	2375	3 1/2 x 5	34x3	34x4	W
Wichita, K	1	2300	4 1/2 x 5 1/2	36x3	36x5	W								Wolverine, J	2	2640	3 1/2 x 5	34x4	34x7	W
Wichita, L	1 1/2	2600	4 1/2 x 5 1/2	36x3 1/2	36x5	W								Wolverine, L	2 1/2	3425	4 1/2 x 5 1/2	36x5	36x10	W
Wichita, M	2	2800	3 1/2 x 5 1/2	36x3 1/2	36x5	W														
Wichita, R	2 1/2	3000	3 1/2 x 5 1/2	36x3 1/2	36x5	W														
Wichita, RX	3 1/2	3600	4 1/2 x 5 1/2	36x4	36x7	W														
Wichita, O	3 1/2	4000	4 1/2 x 5 1/2	36x5	36x8	W														
				36x5	36x5d	W														

\*2-cyl. 16-cyl. 38-cyl. All others, not marked.  
†6-cyl. Trac. Tractor. \*\*Canadian made.  
Final Drive: W—Worm, I—Internal Gear,  
C—Chains, D—Double Reduction, B—Bevel, 4—  
Four-Wheel, E—External Gear. \*Tires—optional,  
†Pneumatic Tires. All others solid. ††—Price in-  
cludes body. \$—Price includes new 11—Price in-  
equipment.

\*2-cyl. 10-hp. 18-cyl. All others, not marked.  
 are 4-cyl. Trac. Tractor. Canadian made.  
 Final Drive: W—Worm, I—Internal Gear,  
 C—Chain, D—Double Reduction, B—Bevel, 4—  
 Four-Wheel, E—External Gear. \*Tires—optional.  
 Pneumatic Tires. All others solid. †—Price in-  
 cludes body. ‡—Price includes several items of  
 equipment.

## Farm Tractor Specifications and Prices

Factor Specifications and Prices																
TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Flow Capacity	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Flow Capacity	
All-In One...	16-30	\$1975	3	Clim.	4-5 x 6 1/2	GDK	3-4	Gray... 1920	18-36	\$2000	3	Wauk	4-4 1/2 x 6 1/2	Gas.	4	
Allis-Chalm. B	6-12	925	2	LeR.	4-3 1/2 x 4 1/2	Gas.	1	Ground Hog	19-31	2000	4	Erd.	4-4 x 6	GorK	3	
Allis-Chalm. G.P.	6-12	850	2	LeR.	4-3 1/2 x 4 1/2	Gas.	1	Gt. Western St	20-30	1950	4	Beav.	4-4 1/2 x 6	GorK	3	
Allis-Chalm. T	12-20	1495	2	Mid.W	4-4 1/2 x 5 1/2	Gas.	2-3	Hart-Parr... 20	20	995	4	Own	2-5 1/2 x 6 1/2	K.D	2	
Allis-Chalm. T-2	10-18	875	4	Own	4-4 1/2 x 5 1/2	GorK	3-4	Hart-Parr... 30	30	1595	4	Own	2-6 1/2 x 7	K.D	2	
Allwork... C	14-28	1875	4	Own	4-4 1/2 x 6	GorK	3	Heider... D	9-16	1170	4	Wauk	4-4 1/2 x 5 1/2	G.K	2	
Andrews-Kin.D	18-36	2500	4	Own	4-5 x 6	GorK	3	Heider... Cult	12-20	1395	4	Wauk	4-4 1/2 x 5 1/2	G.K	2	
Appleton...	12-20	1500	4	Clim.	4-5 x 6 1/2	GorK	3	Hicks... Cult	6-10	1050	4	LeR.	4-3 1/2 x 4 1/2	Gas.	1	
Ara... 1921	3-5	550	4	Buda	4-4 1/2 x 5 1/2	G.K	2-3	Huber Light 4	12-25	1185	4	Wauk	4-4 1/2 x 6	GorK	3	
Aultman-T...	15-30	2200	4	Own	1-4 1/2 x 5	Gas.	1	Huber Super 4	15-30	1885	4	Midw.	4-4 1/2 x 6	Gas.	3	
Aultman-T...	22-45	3850	4	Own	4-5 x 6 1/2	G.K	4	Illinois, Super-Drive	18-36	2375	4	Clim.	4-5 x 6 1/2	G.K	4	
Aultman-T...	30-60	5000	4	Own	4-5 1/2 x 6 1/2	G.K	6	Imperial... E	40-70	5000	4	Own	4-7 1/2 x 9	G.K, D	4	
Automot. B-3...	12-24	1785	4	Her.	4-7 x 9	G.K, D	8	Indiana... F	5-10	895	2	LeR.	4-3 1/2 x 4 1/2	Gas.	1-2	
Avery-SR, Cul-C	5-10	...	4	Own	4-4 x 5 1/2	Gas.	2-3	International...	8-16	900	4	Own	4-4 1/2 x 5	G.K, D	2	
Avery-Cult-C	5-10	...	4	Own	4-3 x 4	G.K	2	International...	15-30	1750	4	Own	4-4 1/2 x 5	G.K, D	2	
Avery... B	5-10	...	4	Own	4-3 x 4	G.K	2	J-T... N	20-40	3485	2	Chief	4-4 1/2 x 6	G.K, D	3-4	
Avery... C	5-10	...	4	Own	4-3 x 4	G.K	2	Klumb... F	16-32	1650	4	Clim.	4-5 x 6 1/2	Gas.	4	
Avery...	8-16	...	4	Own	4-3 x 4	G.K	2	Knuksen, 1920	25-45	2500	4	Own	4-5 x 9	Gas.	4	
Avery...	12-20	...	4	Own	2-5 1/2 x 6	G.K, D	2-3	LaCrosse... M	6-12	650	4	Own	2-4 x 6	G.K	1	
Avery...	12-25	...	4	Own	4-4 1/2 x 6	G.K, D	2-3	LaCrosse... G	12-24	985	4	Own	2-6 x 7	GorK	1	
Avery...	14-28	...	4	Own	2-6 1/2 x 7	G.K, D	3-4	Lauson... 21	15-30	1985	4	Beav.	4-4 1/2 x 6 1/2	Gas.	3	
Avery...	18-36	...	4	Own	4-4 1/2 x 7	G.K, D	3-4	Lauson Road...	15-30	2225	4	Beav.	4-4 1/2 x 6	GorK	3-4	
Avery...	25-50	...	4	Own	4-5 1/2 x 6	G.K, D	4-5	Leader... B	12-18	1095	4	Beav.	4-4 1/2 x 6	GorK	3-4	
Avery...	45-65	...	4	Own	4-6 1/2 x 7	G.K, D	5-6	Leader... N	16-32	1985	4	Own	2-6 x 6 1/2	G.K, D	2-3	
Bates...	15-25	...	4	Own	4-4 1/2 x 6	Ker.	3-4	Leonard... GU	18-35	2775	2	Clim.	4-5 x 6 1/2	G.K	3-4	
Bates Mule H	15-25	...	4	Own	4-4 1/2 x 6 1/2	Gas.	3	Liberty... E	20-30	2530	4	Buda	4-4 1/2 x 6	G.K	3-4	
Bates Mule F	18-25	...	4	Own	4-4 1/2 x 6 1/2	Gas.	3	Linn... H4J	40-60	4500	4	Cont.	4-4 1/2 x 5 1/2	Gas.	4	
Bates Mule G	25-35	...	4	Own	4-4 1/2 x 6 1/2	Gas.	3	Linn... W	60	5100	4	Wauk	4-5 x 6 1/2	Gas.	4	
Beam...	8-16	...	2	Own	4-4 1/2 x 6	Gas.	com.	Little Giant... B	16-32	2200	4	Own	4-4 1/2 x 6	Gas.	4	
Beeman... G	2-4	315	4	Own	1-3 1/2 x 4 1/2	Gas.	2-3	Little Giant... A	26-35	3300	4	Own	4-4 1/2 x 6	Gas.	4	
Best...	2	...	2	Own	4-4 1/2 x 6	G.K, D	1 1/2	Lombard...	85-150	...	2	Own	4-4 1/2 x 6 1/2	Gas.	6	
Best...	60	...	2	Own	4-4 1/2 x 6	G.K, D	1 1/2	Lombard...	50	...	2	Own	4-4 1/2 x 6 1/2	Gas.	6	
Boring... 1921	1850	...	3	Wauk	4-4 1/2 x 6 1/2	G.K, D	8-9	Magnet... B	14-28	1875	4	Wauk	4-4 1/2 x 6 1/2	K&G	3	
Burn-Oh... 1921	15-30	1650	4	Own	2-6 1/2 x 7	Ker.	3-4	Master Jr...	5-10	585	...	LeR.	2-5 1/2 x 4	G&G	3	
Capital...	15-30	1000	2	Own	4-4 1/2 x 6	Gas.	3	Merry Gar 1921	2	230	...	Evin.	1-2 1/2 x 2 1/2	Gas.	1	
Case...	10-18	1090	4	Own	4-4 1/2 x 6	Gas.	3	Minne... All-P	12-25	1200	2	Own	4-4 1/2 x 7	GorK	3-4	
Case...	15-27	1680	4	Own	4-4 1/2 x 6	Gas.	3	Minne... Gen.P	17-30	1850	4	Own	4-4 1/2 x 7	GorK	3-4	
Case...	22-40	3100	4	Own	4-4 1/2 x 6	GorK	3	Med.Duty	22-44	3300	4	Own	4-6 x 7	GorK	5-6	
Caterpillar T11	25	4250	2	Own	4-4 1/2 x 6 1/2	GorK	4-5	Minne... Heavy Duty	35-70	4600	4	Own	4-6 x 7	GorK	5-6	
Caterpillar T16	40	6500	2	Own	4-4 1/2 x 6 1/2	Gas.	4-5	Mohawk 1921	8-16	785	2	Light	4-3 1/2 x 4 1/2	GorK	8-9	
Centaur...	5 1/2	455	2	Own	4-6 1/2 x 7	Gas.	4	Moline Univ D	9-18	990	2	Own	4-3 1/2 x 5	Gas.	2-3	
Chase...	12-25	175	3	Buda	2-4 1/2 x 5 1/2	GorK	1-9	Moline Orch...	9-18	1075	2	Own	4-3 1/2 x 5	Gas.	2-3	
Chicago... 40	40	2500	4	Own	4-4 1/2 x 6	Gas.	2-3	Motor Macult...	1 1/2	195	2	Own	1-2 1/2 x 3 1/2	Gas.	2-3	
Cletrac... F	9-16	845	2	Own	4-4 1/2 x 6	G.K, D	2	Motoz...	15-30	2250	4	Buda	4-4 1/2 x 6	Gas.	3-4	
Cletrac... W	12-20	1490	2	Own	4-4 1/2 x 6	G.K, D	2-3	NB...	1	36	4	Own	2-3 1/2 x 4	Gas.	3 1/2	
Dakota...	15-27	1750	3	Dom.	4-4 1/2 x 6	Gas.	3-4	NB...	2	36	4	Own	2-3 1/2 x 4	Gas.	3 1/2	
Dart...	15-30	2100	4	Buda	4-4 1/2 x 6	Gas.	3-4	Nichols-Shep...	20-42	3200	4	Own	8 x 10	GorK	3-6	
Deane...	20-30	2300	4	Buda	4-4 1/2 x 6	Gas.	3-4	Nichols-Shep...	25-50	3460	4	Own	9 x 12	GorK	4-7	
Dill...	20	2180	4	Cont.	4-4 1/2 x 5 1/2	Gas.	4	Nelson Jr... E	15-25	1775	4	Wauk	4-4 1/2 x 5 1/2	GorK	3-4	
Dill... R.W.	20	2980	4	Midw	4-4 1/2 x 5 1/2	Gas.	3	Nelson Senior...	20-40	2475	5	Wauk	4-5 x 6 1/2	G.K	3	
Doll-All...	7	595	4	Own	1-4 1/2 x 5	Gas.	3	Oil Pull... K	12-20	1485	4	Own	2-6 x 8	K.D	3	
Eagle...	12-22	1100	4	Own	2-7 x 8	GorK	3-4	Oil Pull... H	16-30	2285	4	Own	2-7 x 8 1/2	K.D	3	
Eagle...	16-30	1850	4	Own	2-8 x 8	GorK	4-5	Oil Pull... G	20-40	3175	4	Own	2-8 x 10	K.D	3	
E-B...	12-20	1445	4	Own	4-4 1/2 x 5	G.K, D	3	Oil Pull... E	30-60	4590	4	Own	2-10 x 12	K.D	5-6	
E-B...	16-30	2000	4	Own	4-4 1/2 x 5	G.K, D	3	Oldsmar GarK	2 1/2	395	4	Own	1-3 1/2 x 3 1/2	Gas.	3-4	
Evans...	18-30	2000	4	Buda	4-4 1/2 x 6	G.K	3	Oliver...	A	15-30	...	2	Beav.	4-4 1/2 x 6	GorK	3-4
Fageol... D	9-12	1325	4	Lyc.	4-3 1/2 x 5	Gas.	2	Once Over Til-	15-30	...	2	Beav.	4-4 1/2 x 6	GorK	3-4	
Farm Horse B	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Parrett... K	15-30	3000	4	Strns	4-4 1/2 x 6	Gas.	2	
Farm Horse C	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Peoria... L	12-25	1785	4	Pitt	4-4 1/2 x 6	G.K	3	
Farm Horse D	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Pioneer... C	30-60	...	4	Own	4-5 x 6 1/2	G.K	3	
Farm Horse E	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet Jr...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse F	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet Sr...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse G	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet Tr...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse H	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet V...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse I	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet W...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse J	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet X...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse K	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet Y...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse L	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet Z...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse M	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AA...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse N	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AB...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse O	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AC...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse P	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AD...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse Q	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AE...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse R	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AF...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse S	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AG...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse T	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AH...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse U	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AI...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse V	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AJ...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse W	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AK...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse X	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AL...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse Y	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AM...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse Z	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AN...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AA	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AO...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AB	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AP...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AC	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AQ...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AD	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AR...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AE	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AS...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AF	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AT...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AG	18-30	1885	4	Clim.	4-5 x 6 1/2	G.K	3-4	Planet AU...	5-10	950	2	LeRoi	4-7 x 8	Gas.	10	
Farm Horse AH	18-30	1885	4	Clim.	4-5 x 6 1/2	G										

# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Memphis.....	Tri-State Fair Automobile Show.....	Sept. 24-Oct. 1
Waterloo.....	Automobile Show.....	Sept. 26-Oct. 2
New York.....	Electrical Exposition.....	Sept. 28-Oct. 8
Peoria, Ill.....	National Implement and Vehicle Show.....	Sept. 30-Oct. 8
Cincinnati.....	Fall Automobile Show.....	Oct. 1-8
Oakland, Calif.....	International Traffic Officers' Assn.....	Oct. 24 to 29
Omaha.....	International Automobile Congress.....	Nov. 3-5
Olympia, England.....	Automobile Show.....	Nov. 3-12
Jersey City.....	Second Annual Show.....	Nov. 14-19
Chicago.....	Automotive Equipment Show.....	Nov. 14-19
New York.....	Automobile Show.....	Sept. 23-Oct. 2
Chicago.....	Automobile Salon.....	January, 1922
New York.....	National Automobile Show.....	Jan. 7-13, 1922
Chicago.....	National Automobile Show.....	Jan. 28-Feb. 3, 1922
Minneapolis.....	Tractor Show.....	Jan. 30 to Feb. 4, inclusive
Winnipeg, Canada.....	Canadian Automotive Equipment Assn. Show.....	Feb. 6-11
Louisville, Ky.....	Louisville Automobile Show.....	Feb. 20-25
Des Moines.....	Winter Automobile Show.....	Feb. 26-March 3

## RACES

Fresno, Calif.....	San Joaquin Valley Race.....	Oct. 1
Los Angeles.....	Speedway Race.....	Nov. 24

## FOREIGN SHOWS

Buenos Aires, Argentina.....	Passenger Cars and Equipment.....	September
Luxemburg.....	Luxemburg Agricultural Sample Exhibition.....	September
Berlin.....	Automobile Salon.....	Sept. 23-Oct. 2
Paris, France.....	Paris Motor Show.....	Oct. 5-16
London.....	British Motor Show, Motor Mfgs. and Traders.....	Nov. 4-11
Paris.....	Aviation Exhibition.....	Nov. 12 to 27
Santiago, Cuba.....	Annual Automobile Show.....	March, 1922
Rio de Janeiro, Brazil.....	Automotive Exhibition.....	September, 1922

## CONVENTIONS

Boston.....	Tenth Annual Congress National Safety Council.....	Sept. 26-30
Chicago.....	Twenty-eighth Annual Convention National Implement & Vehicle Assn.....	Oct. 12-14
Cleveland.....	National Tire Dealers' Assn.....	November
New York.....	Service Managers' Convention.....	Nov. 15-16
Columbus, O.....	Ohio Automobile Trade Assn. Meeting.....	Dec. 12, 13, 14

## 1921 Dodge Sales Increase 25% in Northern California

Oakland, Calif., Sept. 16—A comparatively accurate barometer of the improvement of merchandising conditions is offered for northern California by figures recently compiled by Hal Beard, general manager of the H. O. Harrison Co. of this city, direct dealers for Dodge Brothers' motor cars. Beard said:

"While it may be true that some other lines of business are feeling real depression, we have never known such demand for automobiles as at present. In 1917, which was the best year the automobile business enjoyed prior to our entry in the war, the highest month's registration for Dodge cars was 349. In 1919, the best month's registration was 435, a considerable advance over any other month previous. The registration in September, 1920, the best month of that year, rose, however, to 455.

These figures, and those which follow, are for northern California only. The sales of Dodge cars increased steadily



**GETTING** at some cars is about as easy as playing a slide trombone in a telephone booth.

until the peak was reached with 489 new cars registered in March, 1921. This figure stood as a record until June, 1921, when 535 cars were sold and delivered. July followed this, with 555 new Dodges delivered in this territory. This is second only to the record of the Ford.

A total of 2,643 new Dodge motor vehicles have been sold and delivered in northern California during the first seven months of 1921. This is more than 25 per cent more than were delivered in the same territory in the first seven months of 1920."

## FIGHT FORD OWNERS' INSURANCE

Indianapolis, Ind., Sept. 19—Indiana Insurance Commissioner Thomas S. McMurray has notified the prosecuting attorney of Allen county to take immediate legal action against the Ford Car Owners' Protective Assn., operating in Indiana out of Fort Wayne, for alleged violation of the state insurance laws. McMurray took action against the organization after he had been advised by Attorney General U. S. Lesh that the association is doing an insurance business in Indiana, although attempting to cover up the real purpose of its operations. State insurance departments of Michigan and Wisconsin are cooperating with McMurray in bringing action against the association.

## BLAUVELT DIES IN NEW YORK

New York, Sept. 17—Frank Remington Blauvelt, first vice president of the R. K. Carter & Co., buyers for jobbers of automotive supplies, died here last week. He spent most of his business life in the hardware trade. He traveled extensively all over the country and was known both to the jobbing trade and to manufacturers. He was a member of the New York Athletic Club, Royal Arcanum, Hardware Club and several others.

## PARTS JOBBERS ORGANIZE

San Francisco, Sept. 16—The Automobile Parts Jobbers' Assn. has been organized here, with membership limited to those firms and individuals who are engaged in the jobbing of automobile, truck and tractor parts to the repair and garage trade. This eliminates factory representatives or agents as members. Offices have been established, with Frank Kreybill, Jr., elected president for one year, Robert B. Young, secretary, and Bryce Howatson, treasurer. Members are announced as follows:

Patterson Parts, Inc.; Triangle Parts Co., Bryce Howatson, Adams Gear Co., Automotive Parts Co., James Inglis & Co., and the Motor Parts Sales Co., all of San Francisco.

## NEW ENGLAND CAMPS POPULAR

New Haven, Conn., Sept. 17—In line with many of the communities of central and southern New England, New Haven is likely to have adequate camping facilities for motor tourists by next spring to care for the expected heavy demand. The proposition is under consideration by numerous automobile organizations and commercial bodies in the state.